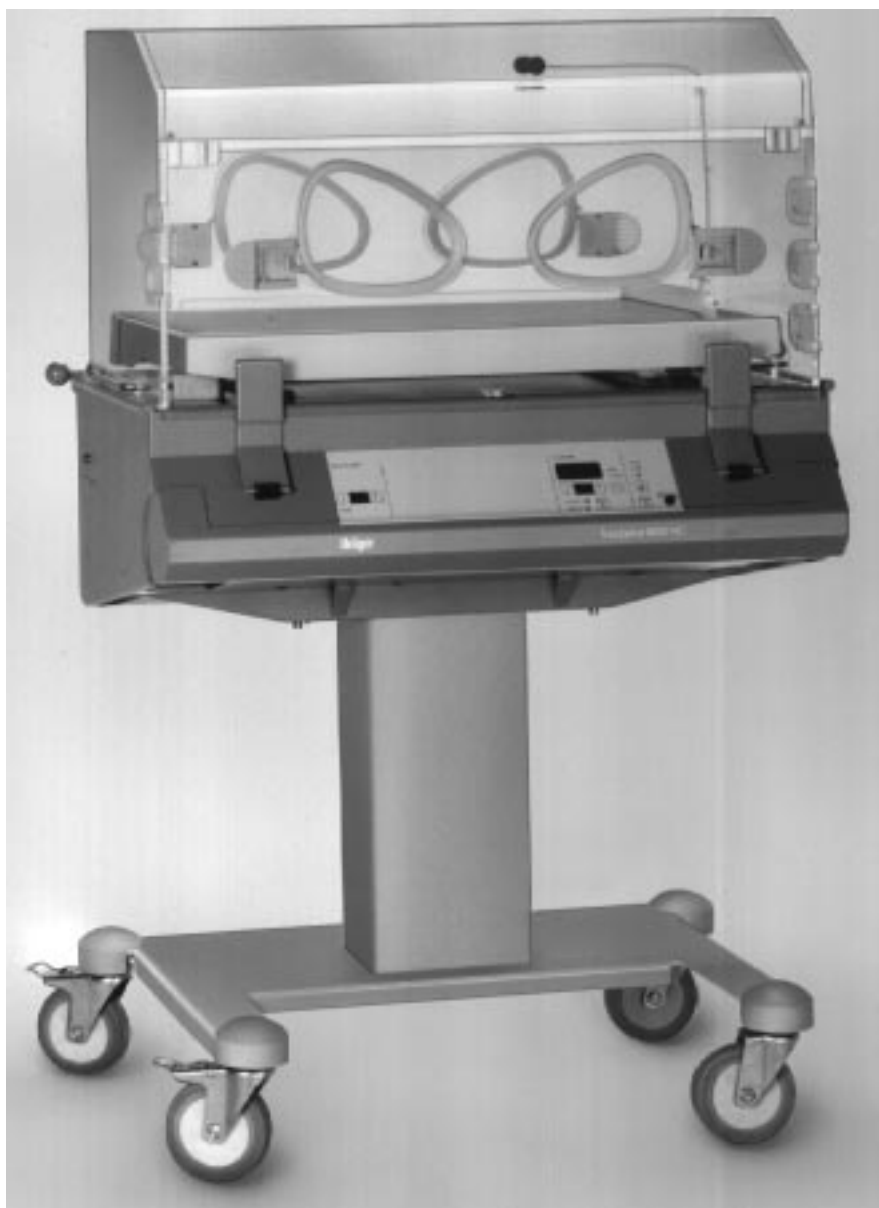


## Incubator 8000 NC

Operating Instructions  
– Software 11.n –





#### NOTICE

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## Introduction

### Operator's Responsibility for Patient Safety

**For correct and effective use of the product and in order to avoid hazards, it is mandatory to carefully read and to observe all portions of this manual.**

The design of the equipment, the accompanying literature, and the labeling on the equipment take into consideration that the purchase and use of the equipment are restricted to trained professionals, and that certain inherent characteristics of the equipment are known to the trained operator. Instructions, warnings, and caution statements are limited, therefore, largely to the specifics of the Dräger design. This publication excludes references to various hazards which are obvious to a medical professional and operator of this equipment, to the consequences of product misuse, and to potentially adverse effects in patients with abnormal conditions. Product modification or misuse can be dangerous. Dräger, Inc. disclaims all liability for the consequences of product alterations or modifications, as well as for the consequences which might result from the combination of this product with other products whether supplied by Dräger or by other manufacturers if such a combination is not endorsed by Dräger, Inc..

The operators of the incubator system must recognize their responsibility for choosing appropriate safety monitoring that supplies adequate information on equipment performance and patient condition. Patient safety may be achieved through a wide variety of different means ranging from electronic surveillance of equipment performance and patient condition to simple, direct observation of clinical signs. The responsibility for the selection of the best level of patient monitoring lies solely with the equipment operator.

## Limitation of Liability

Dräger, Inc.'s liability, whether arising out of or related to manufacture and sale of the goods, their installation, demonstration, sales representation, use, performance, or otherwise, including any liability based upon Dräger, Inc.'s Product Warranty, is subject to and limited to the exclusive terms and conditions as set forth, whether based upon breach of warranty or any other cause of action whatsoever, regardless of any fault attributable to Dräger, Inc. and regardless of the form of action (including, without limitation, breach of warranty, negligence, strict liability, or otherwise).

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Dräger, Inc. shall not be liable for, nor shall buyer be entitled to recover any special incidental, or consequential damages or for any liability incurred by buyer to any third party in any way arising out of or relating to the goods.

## Warranty

All Dräger products are guaranteed to be free of defects for a period of one year from date of delivery.

The following are exceptions to this warranty:

1. The defect shall be a result of workmanship or material. Defects caused by misuse, mishandling, tampering, or by modifications not authorized by Dräger, Inc. or its representatives are not covered.
2. Rubber and plastic components and materials are warranted to be free of defects at time of delivery.
3. Oxygen sensors capsules have warranty up to the expiration date printed on the sensor.

Any product which proves to be defective in workmanship or material will be replaced, credited, or repaired with Dräger, Inc. holding the option. Dräger, Inc. is not responsible for deterioration, wear, or abuse. In any case, Dräger, Inc. will not be liable beyond the original selling price.

Application of this warranty is subject to the following conditions:

1. Dräger, Inc. or its authorized representative must be promptly notified, in writing, upon detection of the defective material or equipment.
2. Defective material or equipment must be returned, shipping prepaid, to Dräger or its authorized representative.
3. Examination by Dräger or its authorized representative must confirm that the defect is covered by the terms of this warranty.
4. Notification in writing, of defective material or equipment must be received by Dräger or its authorized representative no later than two (2) weeks following expiration of this warranty.

In order to assure complete protection under this warranty, the Customer Registration Card and/or Periodic Manufacturer's Service Record (if applicable) must be returned to Dräger within ten (10) days of receipt of the equipment.

The above is the sole warranty provided by Dräger, Inc. No other warranty expressed or implied is intended. Representatives of Dräger are not authorized to modify the terms of this warranty.

Dräger, Inc., USA

## Definitions

### **WARNING !**

A **WARNING** statement refers to conditions with a possibility of personal injury if disregarded.

### **CAUTION !**

A **CAUTION** statement designates the possibility of damage to equipment if disregarded.

**NOTE:** A **NOTE** provides additional information intended to avoid inconveniences during operation.

**Inspection** = examination of measured condition

**Service** = measures to maintain specified condition

**Repair** = measures to restore specified condition

**Maintenance** = inspection, service, and repair, where necessary

**Preventive Maintenance** = Maintenance measures at regular intervals

### **Typing conventions in this manual**

LED display messages are printed in **bold** type,  
e.g: **SEt**

**General WARNINGS and CAUTIONS**

**WARNING !**

Strictly follow this Operator's Instruction Manual!

Any use of the product requires full understanding and strict observation of all portions of these instructions. The equipment is only to be used for the purpose specified under "Intended Use" (see page 11). Observe all **WARNINGS** and **CAUTIONS** as rendered throughout this manual and on labels on the equipment.

**WARNING !**

This device is to be used only in rooms with line power installations complying with national safety standards for hospital patient rooms. (e.g., IEC 601.1, "Safety of Medical Equipment).

To maintain grounding integrity, connect only to a "hospital grade" receptacle. Always disconnect supply before servicing.

**WARNING !**

**DANGER**, risk of explosion if used in the presence of flammable anesthetics.

This device is neither approved nor certified for use in areas where combustible or explosive gas mixtures are likely.

**WARNING !**

Keep space above the incubator clear of obstruction!

Nothing must be kept below the storage cabinets. Hoses, circuits, and cables must be long enough for the height of the incubator being adjusted. They must be routed in a way that no kinking, disconnection or squeezing can occur.

**WARNING !**

Do not use cellular or cordless phones within 33 feet (10 m) of the equipment.

Wireless phones may cause malfunction in electromedical equipment.

**CAUTION !**

**Restriction of Distribution**

Federal Law and Regulations in the United States and Canada restrict this device to sale by or on the order of a physician.

**CAUTION !**

**Traceability**

Federal Law in the United States and requires traceability of this equipment. Please return the self addressed registration card included with the product and fill in all required information

**CAUTION !**

**Maintenance**

In case of malfunction of this device, contact your local DrägerService or our Factory Authorized Technical Service Center.

The device must be inspected and serviced (preventive maintenance) by factory authorized technical service representatives at regular 2 year intervals. A record must be kept on this preventive maintenance. We recommend obtaining a service contract through your vendor.

Maintenance or repair of the Incubator 8000 NC shall be performed only by Dräger authorized technical service representatives.

### Precautions During Preparation

#### Readiness for Operation

##### **WARNING !**

The incubator is ready for operation only when all checks have been performed successfully.

#### Load Limits for Storage Options

##### **CAUTION !**

Maximum load attached to rail must not exceed 25 kg (55 lbs).

### Precautions During Operation

##### **WARNING !**

Never leave baby unattended when front door or hand ports are open to avoid any risk of a patient falling out of the incubator.

#### Temperature

##### **WARNING !**

Always check baby's core temperature at regular intervals!

##### **WARNING !**

Temperatures above 37 °C may only be used on the order of a physician.

In this mode of operation, the baby's temperature must be monitored especially carefully.

##### **WARNING !**

Additional external heat sources, such as sunlight, heat lamps, spot lamps, heated pads, etc. should be avoided. They increase air temperature inside the incubator in an uncontrolled fashion.

##### **WARNING !**

Do not cover phototherapy lights or incubator hood with blankets, aluminum foil, or other materials intended to boost the effect of phototherapy. This would cause build-up of heat since the incubator would not be cooled by ambient air, a factor absolutely essential for operation. - Danger of overheating patient!



**Skin Temperature Control****WARNING !**

Skin temperature control must not be used with babies in shock. Because of reduced peripheral bloodflow the skin temperature of these babies occasionally lies below the core body temperature. Using a skin temperature control system could lead to overheating. We recommend operating the incubator in air temperature control mode when caring for patients with such conditions.

**WARNING !**

Always verify that single use sensor probe is specified and approved for use with Dräger Series 8000 incubators.

**WARNING !**

The sensor probe must never be placed under the baby. It would be measuring and attempting to control core temperature rather than skin temperature in this case.

**WARNING !**

A displaced or detached skin temperature sensor would be measuring air temperature so that the baby could become overheated (the temperature of the air in the incubator would, however, not exceed 39 °C).

**WARNING !**

Do not use skin temperature sensors to rectally measure core temperature.

**Fire hazards associated with the use of oxygen****WARNING !****Fire Hazard!**

Keep matches, lighted cigarettes, and all other sources of ignition out of the room in which the incubator is located. Textiles, oils, and other combustibles are easily ignited and burn with great intensity in an atmosphere enriched with oxygen.

All oxygen valves, connections, and seals must be kept free from oil and grease. - Open valves slowly.

Do not use any electrical equipment inside the incubator other than equipment and instruments expressly designed and approved for use in incubators.

**Physiological risks associated with the use of oxygen****WARNING !****Oxygen Concentration**

The atmosphere inside the incubator should only be enriched with oxygen by or on the order of a physician or respiratory therapist.

It is absolutely essential that elevated oxygen concentrations are selected on the basis of arterially measured oxygen partial pressure in the blood of the baby. This is the only way to minimize the risk of both hyperoxemia, which might cause, above all, retrolenta fibroplasia, and hypoxemia which might contribute to intraventricular hemorrhage and damage to the baby's brain.

**Humidification System****WARNING !**

Use only pure, distilled or demineralized water. Do not add bactericidal agents.

### Precautions During Care

#### **WARNING !**

Always follow established hospital procedures for handling equipment contaminated with bodily fluids.

#### **WARNING !**

Always disconnect from power before cleaning and disinfecting.

#### **WARNING !**

**Danger of burn injury**

The exposed heater surface will still be very hot after operation. It may take up to one hour for the temperature to drop to 70 °C (158 °F) with the incubator closed.

#### **CAUTION !**

Certain components of the incubator consist of materials that are sensitive to certain organic solvents sometimes used for cleaning and disinfecting (e.g., alcohols, phenols, halogen releasing compounds, oxygen releasing compounds, strong organic acids, etc.). Exposure to such substances may cause damage that is not always immediately recognized. Do not sterilize incubator and its components with ethylene oxide (EtO) or by exposure to UV radiation (may cause cracks in the PMMA (Plexiglas®) parts!

#### **CAUTION !**

When disinfecting the (reusable) skin temperature probe, never immerse plug into the fluid.

### Precautions During Maintenance

#### **WARNING !**

To avoid risk of infection, clean and disinfect incubator and accessories before any maintenance according to established hospital procedures – this applies also when returning units or parts for repair.

#### **WARNING !**

Always disconnect supply before servicing.

#### **WARNING !**

Never operate the incubator if it has suffered physical damage or does not seem to operate properly. In this case always refer servicing to properly trained and factory authorized service personnel.

#### **WARNING !**

**Treatment of batteries**

- Do not throw into fire! risk of explosion
- Do not force open! cells contain corrosive acid

#### **WARNING !**

Preventive Maintenance work on the Incubator 8000 NC may be performed by trained and factory authorized staff only.

#### **CAUTION !**

For disposal of batteries, follow all local, state, and federal legislation with respect to environmental protection.

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## Intended Use

For heat therapy for premature babies and sick neonates. With control of air temperature, humidity, and skin temperature.

### **CAUTION !** **Restriction of Distribution**

Federal Law and Regulations in the United States and Canada restrict this device to sale by or on the order of a physician.

### **WARNING !**

Skin temperature control must not be used with babies in shock. Because of reduced peripheral bloodflow the skin temperature of these babies occasionally lies well below the core body temperature. Using a skin temperature control system could lead to overheating. We recommend operating the incubator in air temperature control mode when caring for patients with such conditions.

### **WARNING !**

Only accessories listed in this Operator's Manual are recommended by Dräger for use with the Incubator 8000 NC. The safety of combinations of this device with other equipment is the sole responsibility of the user and must be determined on the basis of the individual situation.

### **WARNING !**

Do not use cellular or cordless phones within 33 feet (10 m ) of the equipment.

Wireless phones may cause malfunction in electromedical equipment.

## Use of Oxygen

### **WARNING !**

#### **Oxygen Concentration**

The atmosphere inside the incubator should only be enriched with oxygen by or on the order of a physician or respiratory therapist.

Always monitor oxygen concentration!

### **WARNING !**

It is absolutely essential that elevated oxygen concentrations are selected on the basis of arterially measured oxygen partial pressure in the blood of the baby. This is the only way to minimize the risk of both hyperoxemia, which might cause, above all, retrolenta fibroplasia, and hypoxemia which might contribute to intraventricular hemorrhage and damage to the baby's brain.

## Description

### Principle of Operation

Heated and humidified air flows into the hood over the full width of the incubator. It is channeled up the front door, along the roof of the hood, and then drawn down along the rear wall via suction.

The baby lies in an area with very little air flow, so that heat loss from convection is minimal.

When opening the hand ports, an effective warm air curtain is retained minimizing cooling of the inside of the incubator.

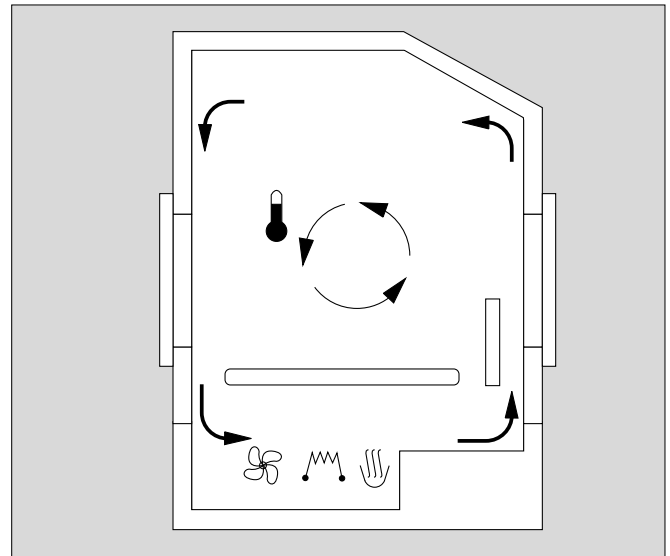
The mattress is made of soft foam plastic encased in film, with low conductive heat loss for the patient.

### Humidity

The incubator air is humidified hygienically by evaporation of heated water from a water container.

Humidity can be set manually on a 1 to 10 scale.

Humidity control off = 0.



### Control

A microprocessor controls the incubator. When it is switched on, and every 10 minutes thereafter, the incubator automatically performs a general self-test. This test checks all safety relevant components.

The heating system is switched off automatically if operating conditions are outside permitted limits.

An auxiliary cooling fan cools the air effectively as soon as the measured value of air temperature exceeds the set value.

### Safety features

After being switched on, the incubator performs a self-test involving a check of all memories in the microprocessor control system and a check to establish whether the various program segments are running correctly.

The function of actuators, feedback signals, and displays is checked by switching them on and off. This test is also repeated every 10 minutes during operation, testing all modules installed in the incubator. An error message is generated for a defective module, even if it is switched off.

### Alarm Hierarchy

The incubator features a hierarchical system of alarms. Any faults occurring generate an alarm signal that is communicated according to its priority. If a non-essential function fails, the functions which are of vital importance remain in operation.

Continuous audible alarm cannot be silenced, employed for faults which entail the greatest potential danger:

- "Air temperature sensor" alarm
- "Fan failure" alarm.

Intermittent audible alarm can be silenced for 10 minutes, for faults associated with a somewhat lower level of potential danger:

- Deviations from set values
- Air temperature too high
- Water shortage
- "Skin temperature sensor" alarm.

Jeder Einzelalarm wird durch die Zentralalarm LED angezeigt, um auch bei hochgeklappter Klappe mit Kurzbedienungsanleitung den Alarm optisch zu erkennen.

In addition, the respective alarm LEDs flash.

If another alarm occurs while the alarm sound has already been silenced, the audible alarm is automatically reactivated. Depending on the cause of the new alarm, this audible alarm may also be silenced. The period for the first audible alarm to automatically recur is then prolonged by the time interval between the two alarms.

### Ergonomics

The hand ports' oval shape allows maximum freedom of movement with low cross-section for reduced heat loss.

The incubator features swiveling castors for good mobility. Two of the castors can be locked in position.

Ancillary equipment can be attached to the side rails.

A swivel cabinet provides storage for patient care supplies.

### Hygiene

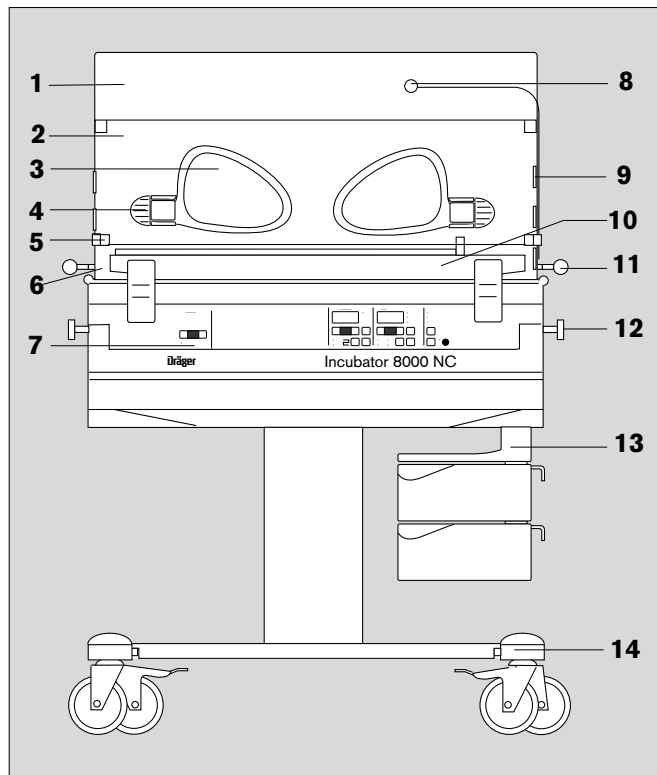
All parts of the incubator which come into contact with the atmosphere breathed by the baby can be removed from the base unit for disinfecting.

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## What's What

### Front View

- 1 Hood
- 2 Main front door segment
- 3 Hand port
- 4 Hand port catch
- 5 Upper front door catches
- 6 Lower front door segment
- 7 Control panel
- 8 Air temperature sensor
- 9 U-grommets
- 10 Bed with mattress and endboard
- 11 Mounting rail, left and right, (option)
- 12 Bed tilt hand wheels, left and right, (option)
- 13 Swivel cabinet, (option)
- 14 Fixed height mobile stand with four castors (2 lockable)

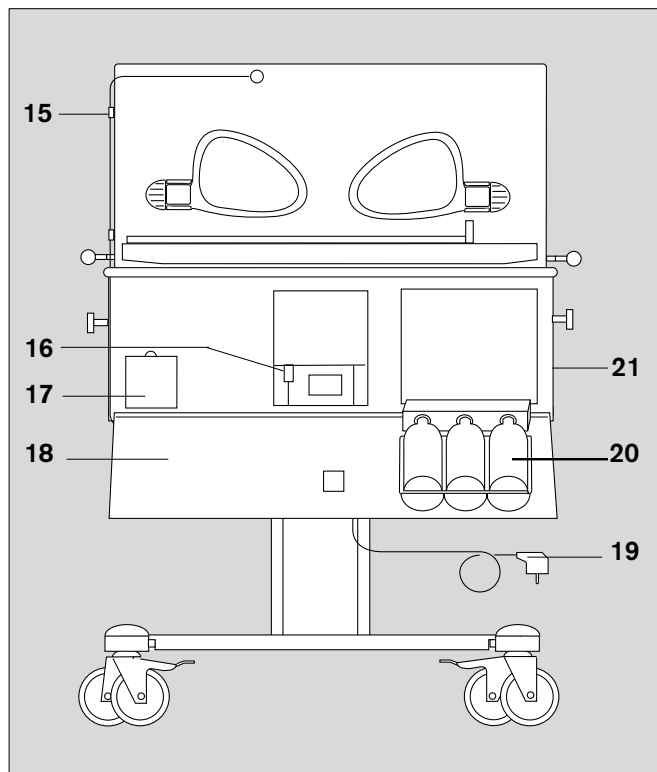


### Rear View

- 15 Temperature sensor cable clips
- 16 Socket for air temperature sensor connector
- 17 Air filter
- 18 Back flap
- 19 Power cable
- 20 Water bottles with container

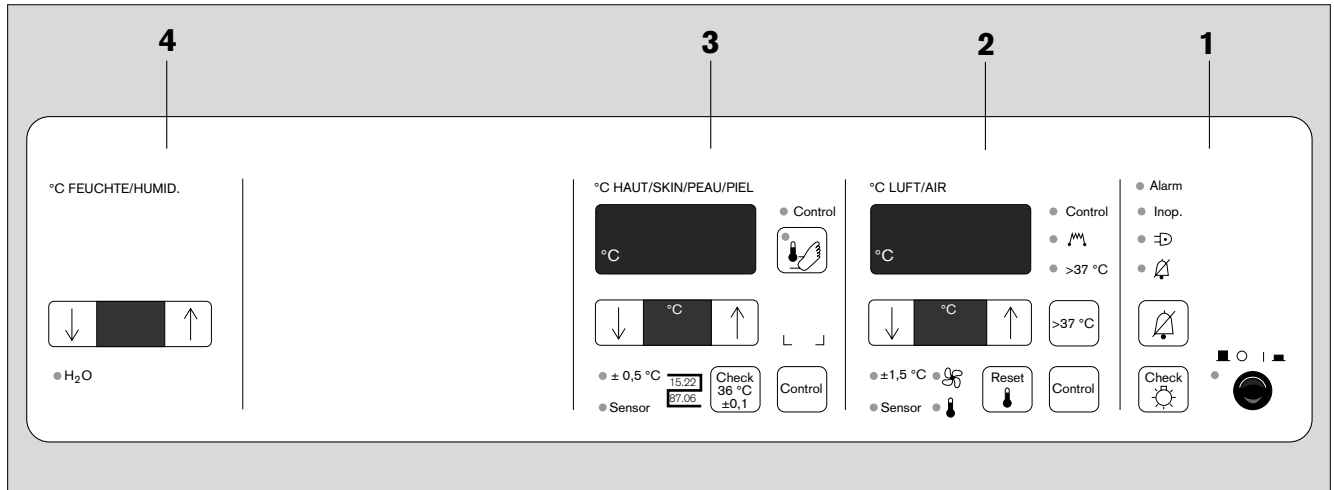
An der Seite des Inkubators:

- 21 Socket for skin temperature sensor (option)  
Obere Buchse: Hauttemperatur-Regelung  
Untere Buchse: nur für ThermoMonitoring





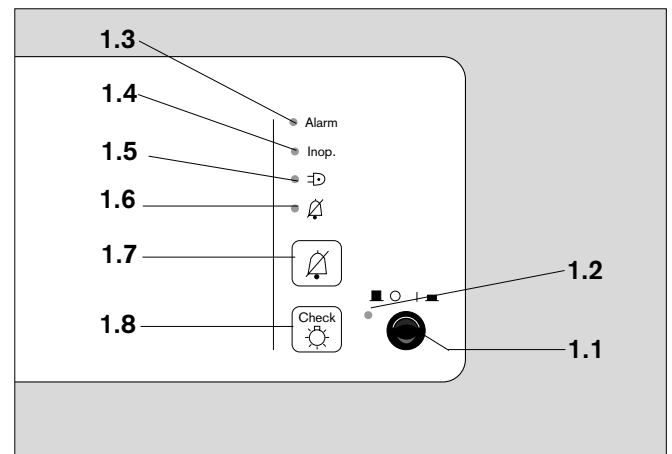
## Control Panel



- 1 Main module with on/off switch and check key
- 2 Air temperature control module
- 3 Skin temperature control module
- 4 Humidity control module

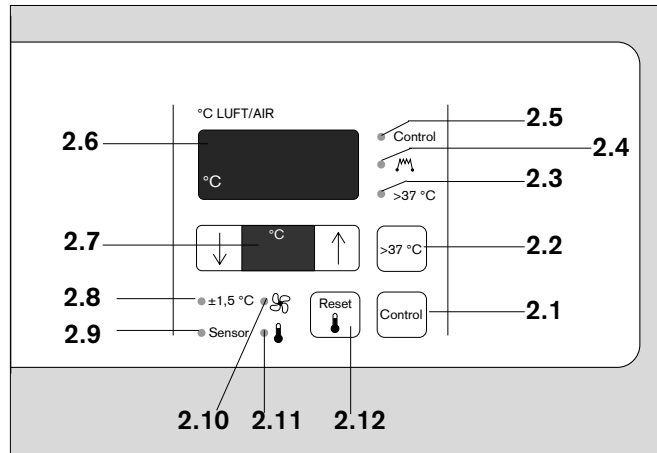
## Main Module

- 1.1 On/off switch for line power
- 1.2 Green LED, stays lit while incubator is switched on.
- 1.3 Rote LED Alarm, leuchtet wenn eine Störung in einem Modul ist.
- 1.4 Red LED Inop lights in case of a defect during operation.
- 1.5 Red LED is lit during power failure.
- 1.6 Yellow LED stays lit while intermittent audible alarm is silenced.
- 1.7 Silence key for muting audible alarm for 10 minutes.
- 1.8 Key for checking operation of displays, LEDs and audible alarm.



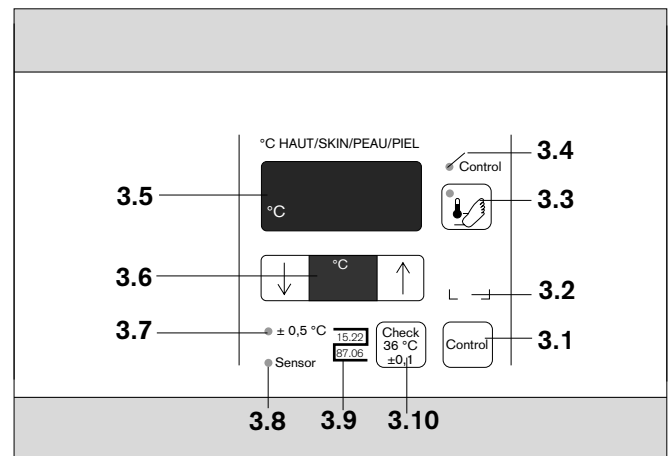
## Air Temperature Control Module

- 2.1 Key to switch on air temperature control (only with skin temperature control option).
- 2.2 Unlocking key, extends range for set temperatures
- 2.3 Yellow LED  $>37^{\circ}\text{C}$ , is lit when a higher range of values has been set.
- 2.4 Green LED  $\text{flame}$  , indicates warming-up phase.
- 2.5 Green LED **Control**, stays lit while air temperature control is on (only when skin temperature control module is installed).
- 2.6 Display for actual (measured) value of air temperature.
- 2.7 Display for set value of air temperature; left key: decreases set value right key: increases set value
- 2.8 Red LED  $\pm 1.5^{\circ}\text{C}$  flashes/is lit while the measured value of the air temperature is deviating from the set value by more than  $1.5^{\circ}\text{C}$ .
- 2.9 Red LED **Sensor** flashes when air temperature sensor is defective.
- 2.10 Red LED flashes in case of fan failure.
- 2.11 Red LED  $\text{thermometer}$  for overtemperature Lights up when air temperature is or was higher than  $38^{\circ}\text{C}$  ( $40^{\circ}\text{C}$  during operation in extended range) and after an **inop**-alarm.
- 2.12 Key to reset overtemperature alarm.



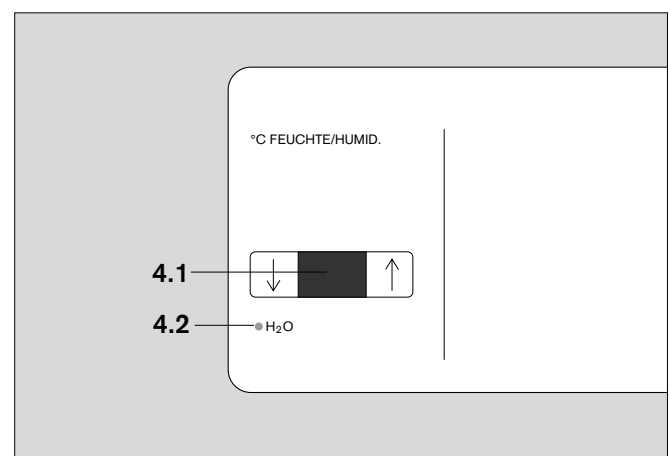
## Skin Temperature Control Module

- 3.1** On/off button for skin temperature control.
- 3.2** Calibration sign, not applicable in the US.
- 3.3** Button to display the peripheral skin temperature, only with optional ThermoMonitoring.
- 3.4** Green LED **Control**; is lit when skin temperature module is switched on.
- 3.5** Display for actual (measured) value of skin temperature.
- 3.6** Display for set value for skin temperature  
left key: decreases set value  
right key: increases set value
- 3.7** Red LED  $\pm 0.5\text{ }^{\circ}\text{C}$   
flashes/is lit when the measured value of skin temperature deviates from the set value by more than  $0.5\text{ }^{\circ}\text{C}$ .
- 3.8** Red LED **Sensor**  
flashes/is lit when the skin temperature sensor is defective or disconnected.
- 3.9** Registration sign, not applicable in the US.
- 3.10** Key for simulating reference temperature of  $36 \pm 0.1\text{ }^{\circ}\text{C}$ .



## Humidity Control Module

- 4.1** Display for set value of heater level: 0 to 10  
0 = humidity control off;  
left key: decreases set value  
right key: increases set value
- 4.2** Red LED H<sub>2</sub>O  
flashes/is lit in case of empty water supply.



## Labels

**WARNING !**  
**DANGER OF PATIENT INJURY**  
 NEVER LEAVE BABY UNATTENDED WHEN  
 FRONT DOOR OR HAND PORTS ARE OPEN

**DANGER !**  
**RISK OF EXPLOSION IF USED IN THE PRESENCE OF FLAMMABLE ANESTHETICS**

**WARNING - FIRE HAZARD !**  
 KEEP MATCHES, LIGHTED CIGARETTES, AND ALL OTHER SOURCES OF IGNITION OUT OF THE ROOM IN WHICH THE INCUBATOR IS LOCATED. TEXTILES, OILS, AND OTHER COMBUSTIBLES ARE EASILY IGNITED AND BURN WITH GREAT INTENSITY IN AIR ENRICHED WITH OXYGEN.

ALL OXYGEN VALVES, CONNECTIONS, AND SEALS MUST BE KEPT FREE OF OIL AND GREASE. - OPEN VALVES SLOWLY.

DO NOT USE ANY ELECTRICAL EQUIPMENT INSIDE THE INCUBATOR OTHER THAN EQUIPMENT OR INSTRUMENTS EXPRESSLY DESIGNED AND APPROVED FOR USE IN INCUBATORS.

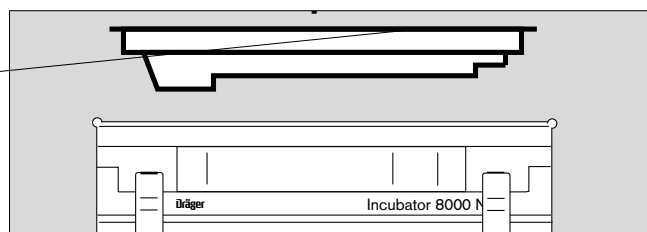
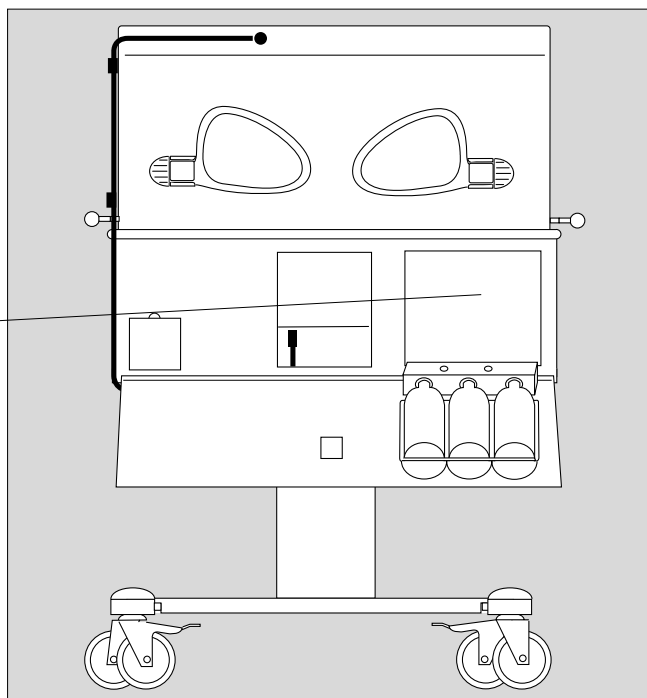
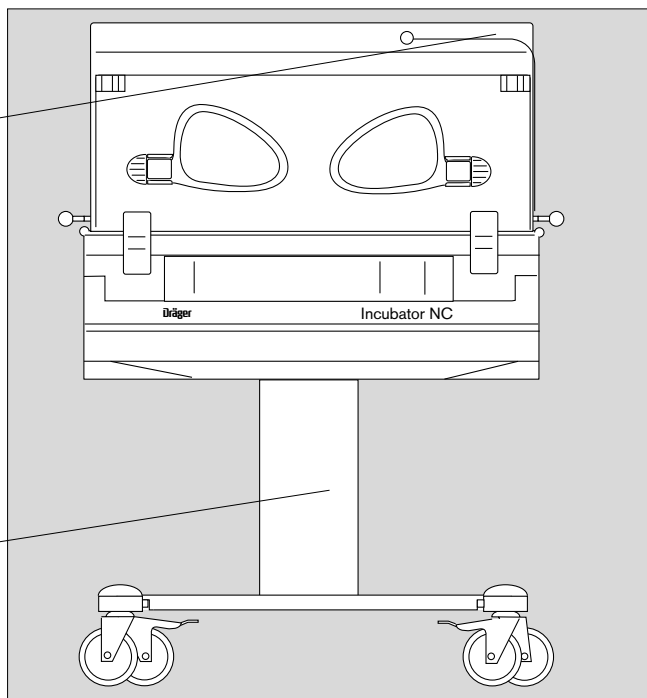
**WARNING !**  
 THE ATMOSPHERE INSIDE THE INCUBATOR SHOULD ONLY BE ENRICHED WITH OXYGEN BY OR ON THE ORDER OF A PHYSICIAN OR RESPIRATORY THERAPIST.

IT IS ABSOLUTELY ESSENTIAL THAT ELEVATED OXYGEN CONCENTRATIONS ARE SELECTED ON THE BASIS OF ARTERIALLY MEASURED OXYGEN PARTIAL PRESSURE IN THE BLOOD OF THE BABY. THIS IS THE ONLY WAY OF MINIMIZING THE RISK OF BOTH HYPEROXEMIA, WHICH MIGHT CAUSE, ABOVE ALL, RETROLENTAL FIBROPLASIA, AND HYPOXEMIA WHICH MIGHT CONTRIBUTE TO INTRAVENTRICULAR HEMORRHAGE AND DAMAGE TO THE BABY'S BRAIN.

**CAUTION !**  
 TO MAINTAIN GROUNDING INTEGRITY, CONNECT ONLY TO A "HOSPITAL GRADE" RECEPTACLE  
 TO REDUCE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER  
 USE ONLY DRY AND CLEAN COMPRESSED AIR AND OXYGEN. WATER IN GAS SUPPLY CAN CAUSE EQUIPMENT MALFUNCTION  
 FEDERAL (USA) LAW RESTRICTS THIS DEVICE TO SALE BY OR ON THE ORDER OF A PHYSICIAN

**WARNING !**  
 USE ONLY PURE, DISTILLED WATER  
 DO NOT ADD BACTERICIDAL AGENTS

**WARNING !**  
**DANGER OF BURNING INJURY**  
 DO NOT TOUCH HOT HEATER ELEMENT  
 LET HEATER COOL DOWN BEFORE  
 CLEANING



## Preparation

### Before First Time Use

- Check that all packaging material has been removed.

### Front Flap

To open the front flap

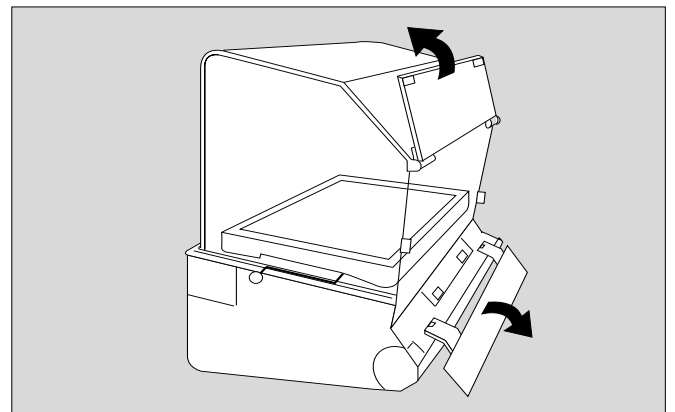
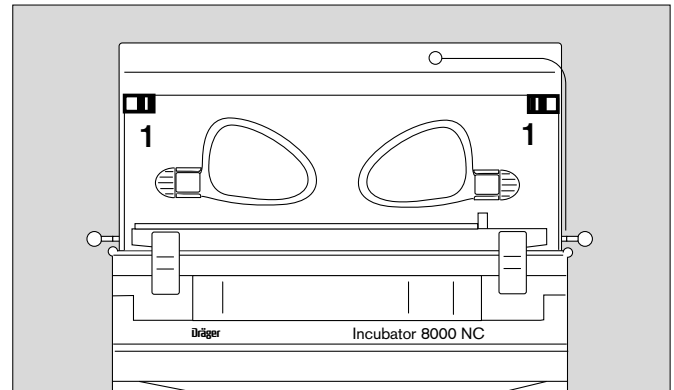
- 1 Squeeze catches with thumb and index finger and open the front door.

Regular front flap: Guide flap slowly down until it rests completely on the incubator base.

Scandinavian flap: Swing upper part of the flap up until it rests completely on the hood.

To close the front flap

- Press latch together with thumb and index finger and press front flap against the hood. After engaging the front flap, the red index will no longer be visible.



Optional scandinavian hood:

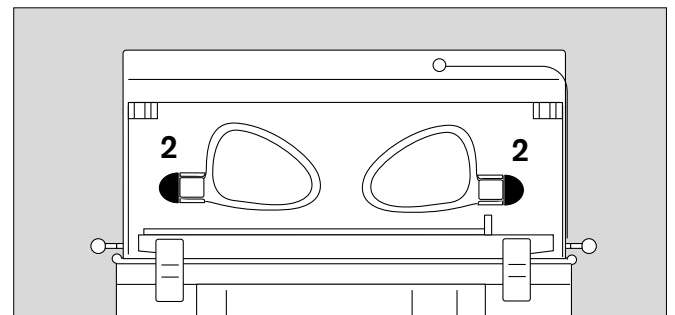
### Port Hole Doors

To open a port hole door

- 2 press the outer part of the notch down and the port hole door will swing open.

To close a port hole door

- press door gently back until it snaps in with a click.



# Preparation

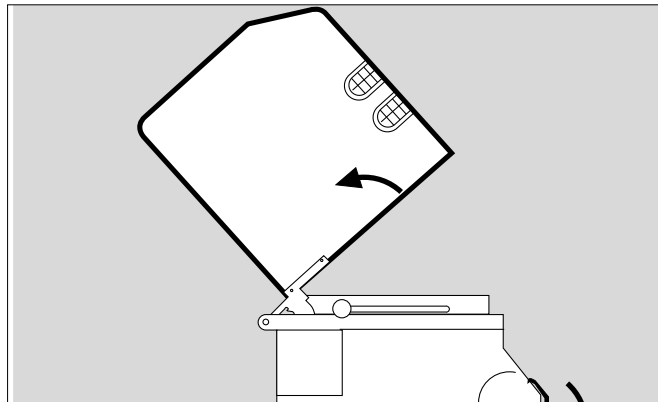
Hood  
Open up Double Walls  
Mattress

## Hood

To open the hood

- Tilt the hood back as far as it will go.

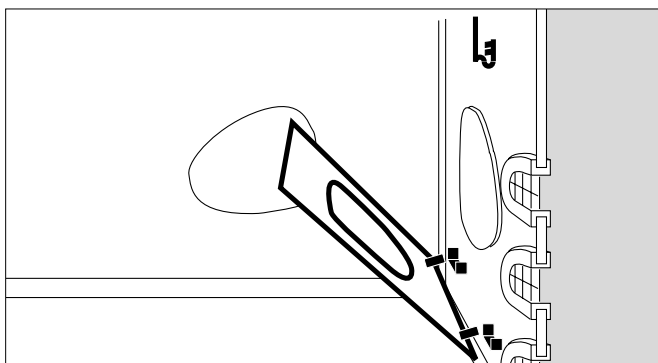
**NOTE:** Do not let the hood fall back to the normal position on the incubator base by itself.



## Open up Double Walls

e.g. to clean the hood.

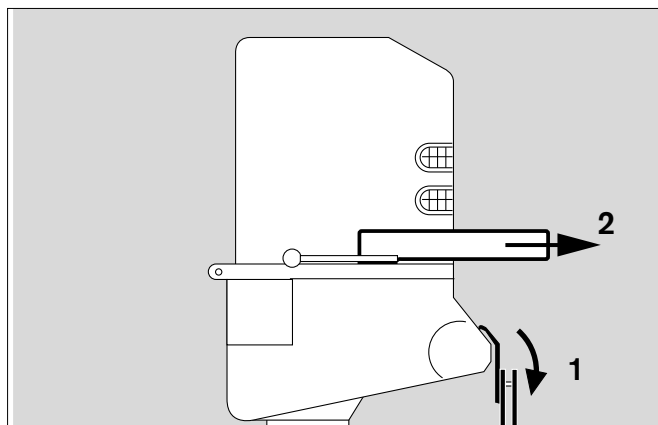
- Open front door.
- Open upper clamp and fold up inner wall.
- To put the inner wall back in operating position fold up the panel and push against the clamp.



## Mattress

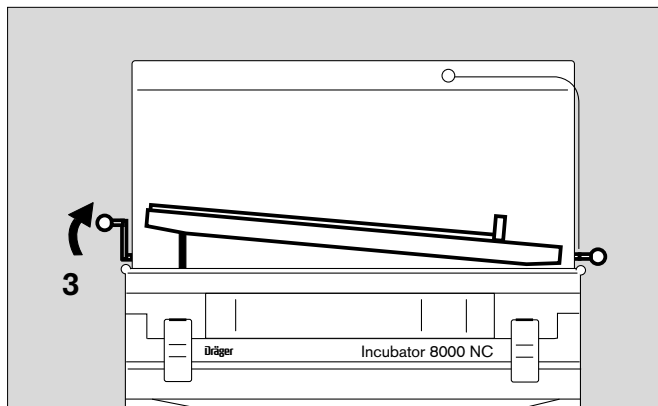
To pull out the mattress

- 1 open front door,
- 2 pull out strecher with mattress as far as it goes.



## Trendellenburg Position

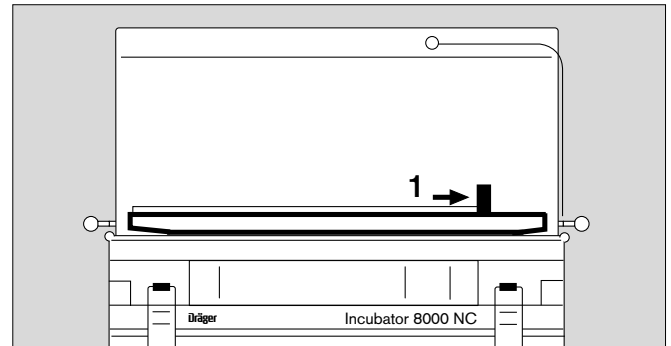
- 3 Raise left lever – left end of bed is lifted.
- Put bed at maximum height; lever engages.
- 
- Raise right lever – right end of bed is lifted.
  - Put at maximum height; lever engages.



## Repositioning Bed Endboard

Board may be used at right or left end of bed, as required.

- Squeeze catches with thumb and index finger and open the front door.
- 1** Push middle of endboard outwards until released from its groove, and
  - reposition on other end of bed.
  - Cover mattress with clean sheet and place on bed.
  - Close front door. Red marks on door catches should no longer be visible indicating that the catches are fully engaged.



## Preparation

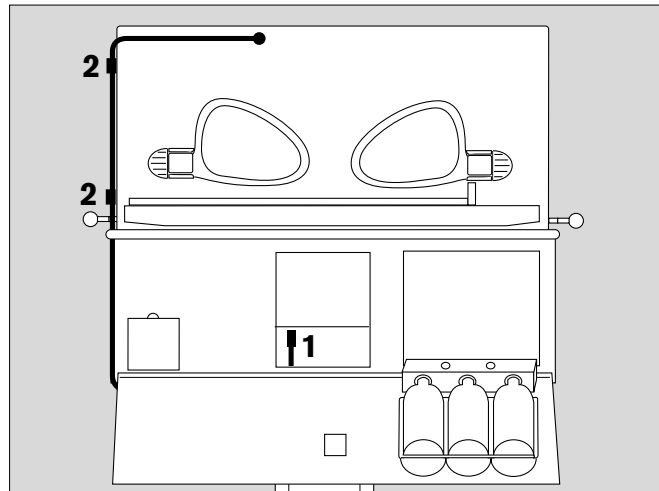
## Mounting Accessories

### Connecting Air Temperature Sensor

### Installing Accessories

#### Connecting Air Temperature Sensor

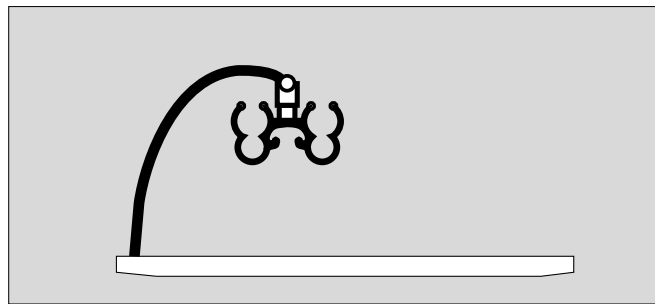
- Open back flap of the incubator.
- Push plug of air temperature sensor through opening in bottom of rear incubator body (from below), and
  - 1 push into socket until it engages.
  - 2 Route sensor cable using cable clips provided on the hood.



#### Mounting Accessories

#### Ventilator circuit support arm

- Fold down front door.
- Raise bed and lift out of incubator.
- Push mattress slightly to one side. Push hose support into appropriate hole, right or left.
- Screw on knurled screws from below and tighten.
- Replace bed in the incubator and close front door.



#### Installing rail

Rail for attaching:

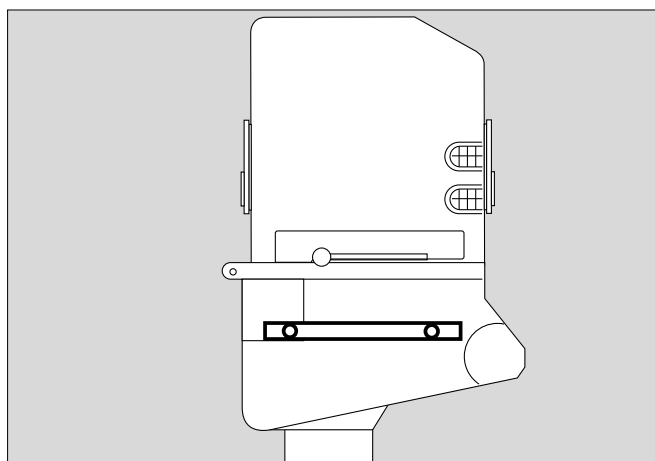
Suction equipment

Instrument tray

Mounting plate for auxiliary equipment (Dräger RS enclosures)

Oxygen equipment

- Attach rail to left or right side of incubator body using 4mm (5/32") hex cap screws (supplied).



#### CAUTION !

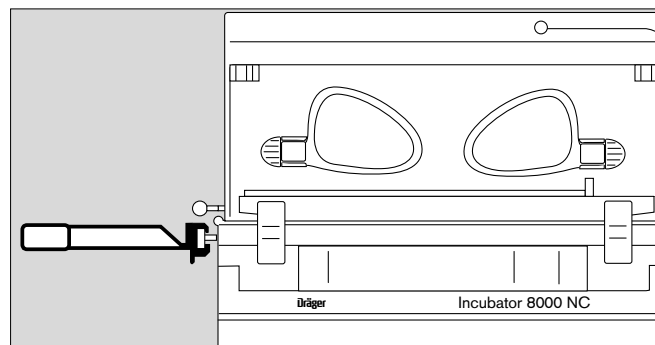
Maximum load attached to rail must not exceed 55 lbs (25 kg).



### Instrument tray

(for small items)

- Attach tray to hand rail and tighten.  
Observe load limit of 4 lbs (2 kg).



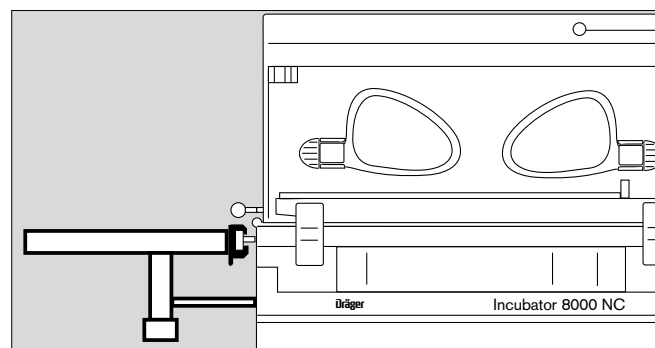
### Mounting plate

Monitor and ventilator support with latching system for standard Dräger RS enclosure, e. g. Babylog 8000.

#### CAUTION !

Maximum load on RS mounting plate must not exceed 55 lbs (25 kg).

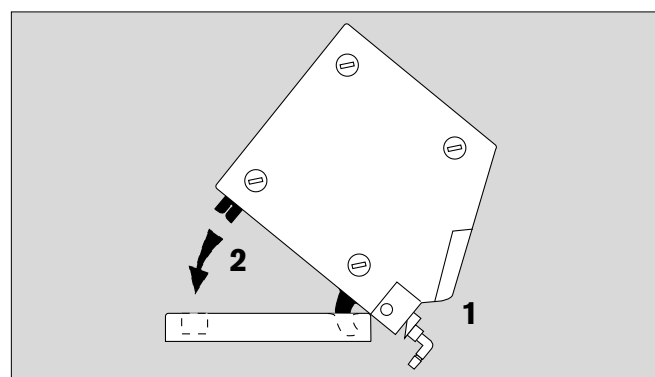
- Attach plate to rail and tighten clamp.



### Attaching equipment to mounting plate

Example: Babylog 8000

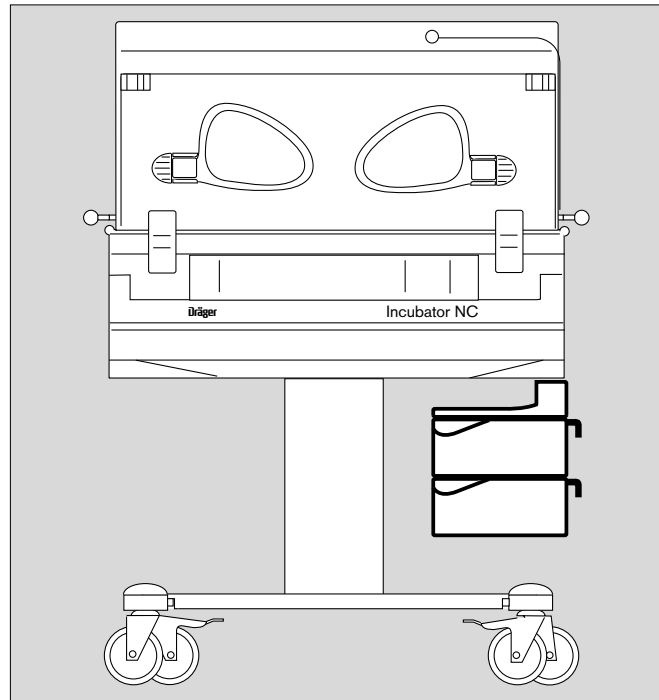
- Remove plastic foot strips from ventilator.
  - Tilt Babylog forward by about 45°.
- 1 Insert front latches into slots in mounting plate.
  - 2 Lower Babylog, insert rear latches into slots in mounting plate, and secure at the back with knurled screws.



### Swivel cabinet (option)

To install a swivel cabinet:

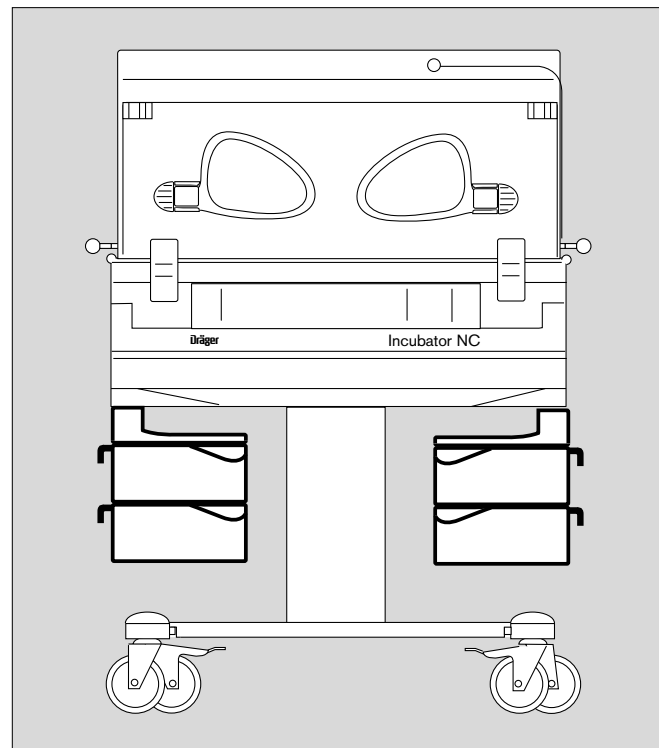
- Push hex cap screw up through cabinet from below and tighten to mounting bracket on incubator.
- Insert extra drawer organizers.
- Fill swivel storage with necessary supplies.



### Additional Swivel cabinet (option)

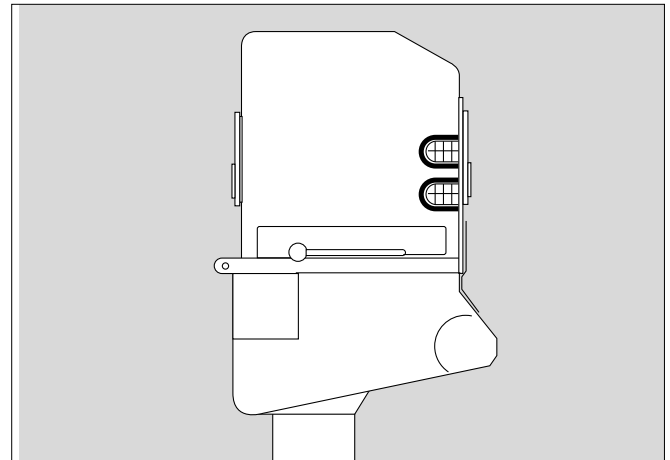
To install a swivel cabinet:

- Push hex cap screw up through cabinet from below and tighten to mounting bracket on incubator.
- Insert extra drawer organizers.
- Fill swivel storage with necessary supplies.

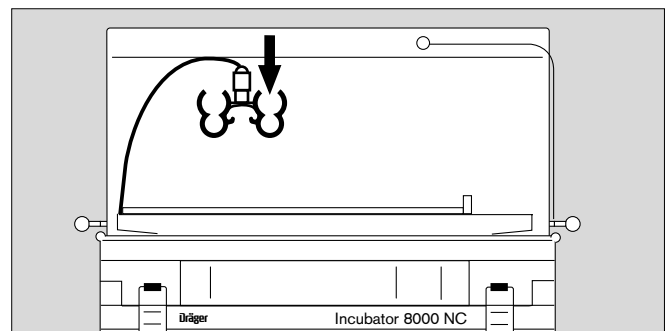


### Routing Cables and Hoses

- Route hoses, cables, or lines through the access grommets provided.



- Attach ventilator circuits and cables to clips on end of support arm.



### Preparing for Oxygen Therapy

- for enriching incubator atmosphere with oxygen
- for oxygen enrichment under a head box

**WARNING !**  
**Oxygen Concentration**

The atmosphere inside the incubator should only be enriched with oxygen by or on the order of a physician or respiratory therapist.

**Always monitor oxygen concentration!**

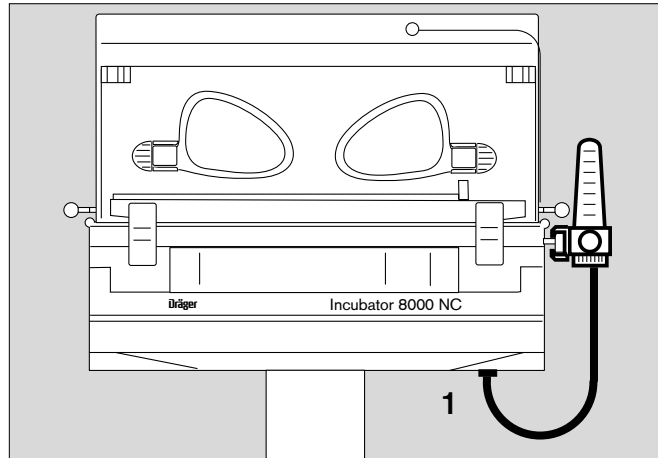
- Always observe all Operating Instructions of the equipment used.

## Preparation

## Preparing for Oxygen Therapy

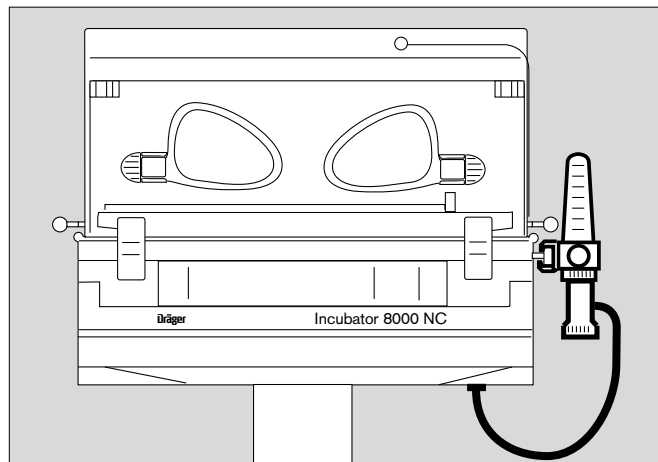
- Mount O<sub>2</sub> flowmeter to rail or directly to O<sub>2</sub> wall outlet
- Attach hose to connector nipple on O<sub>2</sub> flowmeter and 1 to O<sub>2</sub> port at the right underneath incubator body.

**NOTE:** The Incubator 8000 NC features an unrestricted oxygen input port. In order to restrict flow to limit oxygen concentrations, use external oxygen limiter.

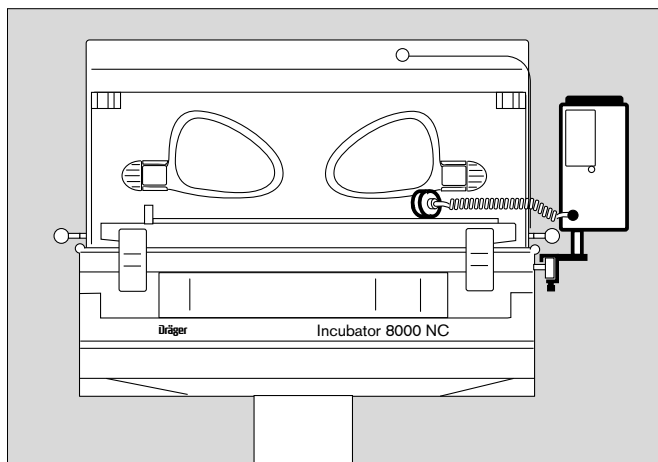


If an oxygen limiter is used:

- Connect oxygen limiter between O<sub>2</sub> flowmeter and incubator port.



- Attach O<sub>2</sub> analyzer to rail with appropriate clamp adapter
- Place O<sub>2</sub> sensor in incubator.
- Use U-grommets to route sensor cable through incubator hood and connect sensor to analyzer.



### **WARNING !**

#### **Oxygen Concentration**

It is absolutely essential that elevated oxygen concentrations are selected on the basis of arterially measured oxygen partial pressure in the blood of the baby. This is the only way to minimize the risk of both hyperoxemia, which might cause, above all, retrolenta fibroplasia, and hypoxemia which might contribute to intraventricular hemorrhage and damage to the baby's brain.

### Checking Readiness for Operation

#### Before using incubator for the first time

- Verify that line voltage corresponds to the specification on the rating plate.

#### Before each use

- Verify that equipment has been disinfected.
- Check that adequate gas supply is available for all equipment to be used.
- Check that all accessories and therapy equipment required are available and in good condition. Check readiness for operation of accessories according to their respective Operating Instructions.
- Check that the incubator hood has no cracks or sharp, chipped edges.
- Check that hinges and pivots on the hood are in proper working order.
- Check that all cables and hoses are routed correctly and securely.
- Netzstecker in eine Wandsteckdose einstecken.



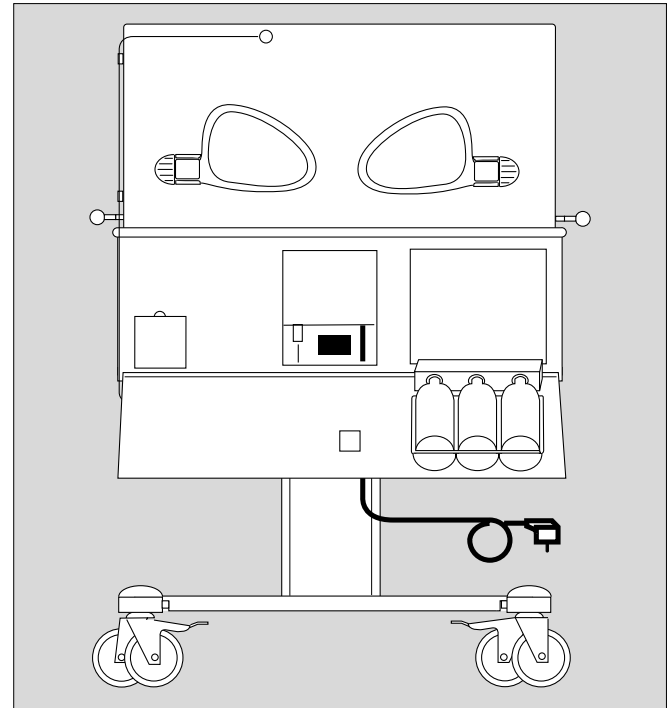
#### **Keine Mehrfachsteckdosen verwenden!**

Bei Schutzleiterbruch in der Zuleitung der Mehrfachsteckdose kann der zulässige Grenzwert für Ableitströme überschritten werden. Elektrische Gefährdung von Patient und Personal.

### **WARNING !**

**This device is to be used only in rooms with line power installations complying with national safety standards for hospital patient rooms. (e.g., IEC 601.1, "Safety of Medical Equipment).**

**To maintain grounding integrity, connect only to a "hospital grade" receptacle. Always disconnect supply before servicing.**

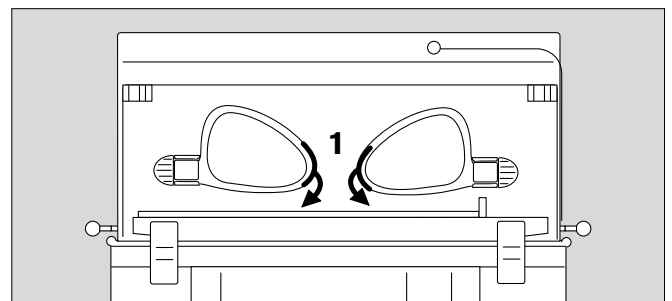


### Checking hand ports for proper closure

- 1 Grip rim of closed hand port and pull outwards – it should not open.

In case hand port does not remain engaged:

- Call DrägerService.
- Check all hand ports.



# Checking Readiness for Operation

Checking front door flaps

Checking air filter

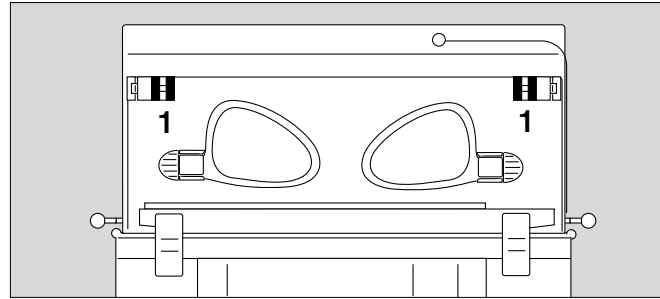
Testing bed tilt mechanism

## Checking front door flaps for proper closure

- 1 Squeeze catches together on both sides with thumb and index finger – front door flaps open.
- Close front door. Red marks on door catches should no longer be visible indicating that the catches are fully engaged.

If the front door does not engage properly:

- Call DrägerService.



## Checking air filter

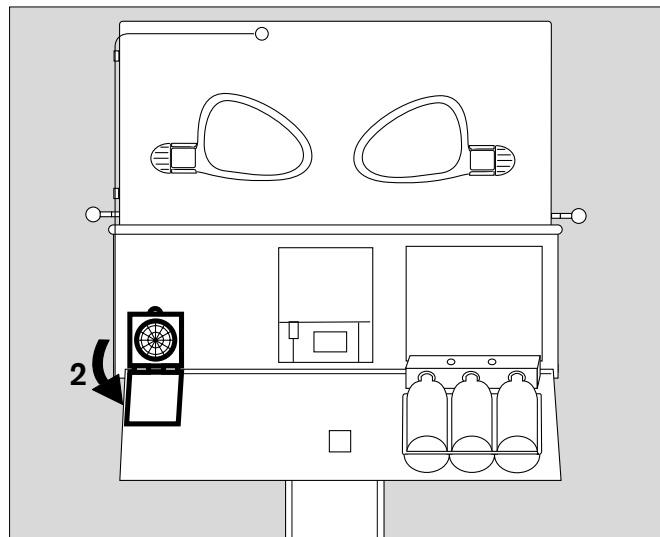
- Open and lower the rear panel.
- 2 Flip filter cover plate down.

If a filter is installed:

- Remove filter and check installation date; write-on label should be on edge of filter.

If filter is more than 2 months old:

- Replace with a new filter.
- Write installation date on filter label and stick to edge of filter.
- Press filter firmly into the seal. Make sure that the direction of flow through filter is correct. Arrow on filter indicating flow direction must point into incubator.
- Close cover plate.



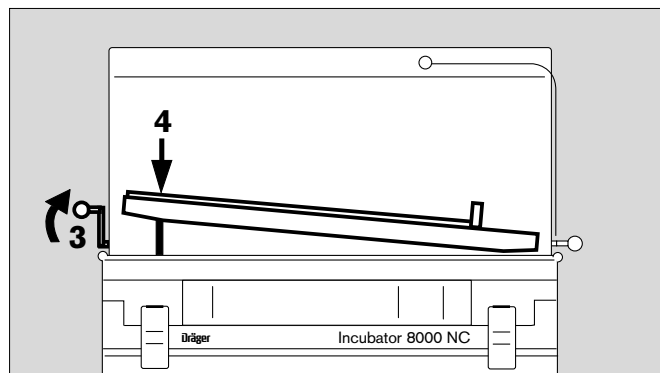
## Testing bed tilt mechanism

- 3 Raise left lever – left end of bed is lifted.
- Put bed at maximum height; lever engages.
- 4 Press down on raised bed with hand – bed must not drop down.

If bed drops down:

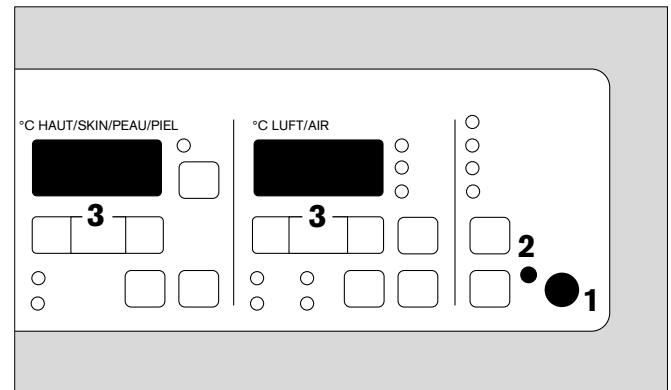
- Call DrägerService.

- Raise right lever – right end of bed is lifted.
- Put at maximum height; lever engages.
- Check right end of bed, as above.
- Raise bed at one end as required for patient.




### Activating incubator self-test

- 1 Push power switch down – until it engages = ON.  
Incubator performs self-test.
- 2 Green LED is lit.
- 3 Display of measured values shows dashes.  
If **Err** is displayed = error, see page 56.



### Checking power failure alarm and NiCd battery

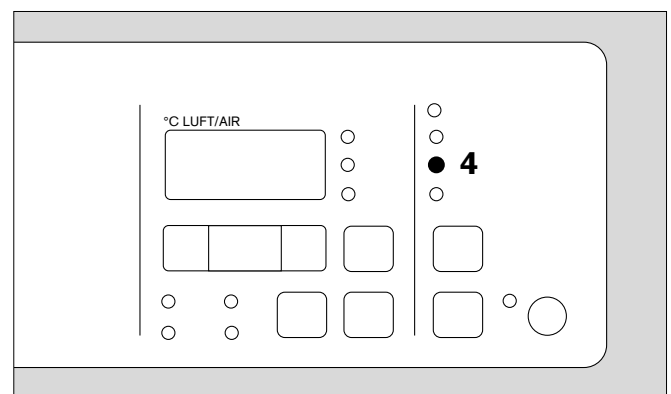
- Disconnect power (while unit is switched on).
- 4 Red LED  lights up. Continuous audible alarm starts. The volume should remain constant for at least 30 seconds.

If the volume drops too soon:


- Leave incubator connected to power and switched on for 24 hours to charge NiCd battery.
- Repeat check.

If volume still drops too soon:

- Call DrägerService.



### Checking LEDs, displays and alarm sound

- 1 Press  button:  
For about 2 seconds – all LEDs are lit (except the power failure LED), the digital displays show **88.8** and an audible alarm is generated.

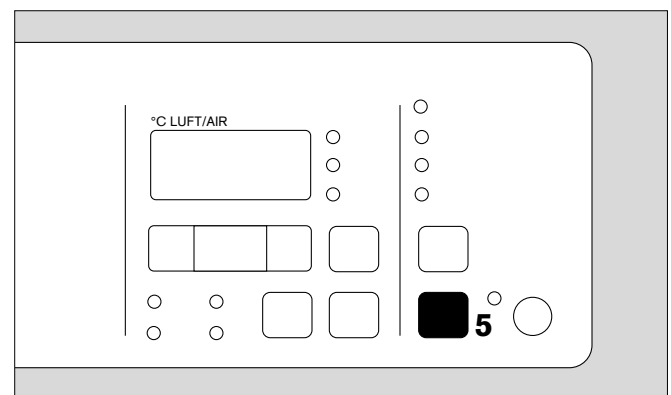
Thereafter, displays and LEDs go dark and audible alarm stops. After approximately another 2 seconds, the original displays for measured and set values reappear.

**NOTE:** This check can also be carried out during operation and does not alter any of the settings.

- Perform check at least once daily.

If there is a defect:

- Call DrägerService.



### **WARNING !**

**The incubator is ready for operation only when all checks have been performed successfully.**

## Operation

### General Precautions During Patient Care

#### Warm-up time

Allow adequate time for the incubator to warm up before placing a baby inside (about 35 minutes).

Recommendation: operate incubator in standby, see page 36.

#### Incubator temperature control system

- Desired temperature increases occur quickly thanks to powerful heater.
- Temperature drops slowly due to good thermal insulation

#### **WARNING !**

Additional external heat sources, such as sunlight, heat lamps, spotlamps, heated pads, etc. should be avoided. They increase air temperature inside the incubator in an uncontrolled fashion.

#### Considerations when setting incubator air temperature

The baby experiences minimal heat loss

- by convection because of low air speed across bed
- by conduction through the mattress
- by evaporation when high humidity setting is chosen.

#### **WARNING !**

Always check baby's core temperature at regular intervals!



### Reducing incubator temperature

The time it takes for the incubator to cool off is a design feature, it can be shortened when necessary by:

- reducing the outside (room) temperature (where possible),
- reducing the incubator setting for humidity.

The rate of cooling is **not** accelerated by:

- setting the air temperature to a lower value than is actually required.

In **urgent** cases: open front door or hand ports.

#### **WARNING !**

Never leave baby unattended when front door or hand ports are open to avoid any risk of a patient falling out of the incubator.

### Fire hazards associated with the use of oxygen

#### **WARNING !**

##### **Fire Hazard!**

Keep matches, lighted cigarettes, and all other sources of ignition out of the room in which the incubator is located. Textiles, oils, and other combustibles are easily ignited and burn with great intensity in an atmosphere enriched with oxygen.

All oxygen valves, connections, and seals must be kept free from oil and grease. - Open valves slowly.

Do not use any electrical equipment inside the incubator other than equipment and instruments expressly designed and approved for use in incubators.

### Physiological risks associated with the use of oxygen

#### **WARNING !**

##### **Oxygen Concentration**

The atmosphere inside the incubator should only be enriched with oxygen by or on the order of a physician or respiratory therapist.

It is absolutely essential that elevated oxygen concentrations are selected on the basis of arterially measured oxygen partial pressure in the blood of the baby. This is the only way to minimize the risk of both hyperoxemia, which might cause, above all, retrolenta fibroplasia, and hypoxemia which might contribute to intraventricular hemorrhage and damage to the baby's brain.

### Breathing gas temperature

During ventilation, always consider the possibility of additional heat transfer by circulating, heated air to ventilator circuits routed inside the hood. It is therefore necessary to continuously monitor breathing gas temperature.

### Considerations during phototherapy

Absorption of light through a baby's skin will supply heat which may increase the baby's core temperature.

Therefore:

- Decrease air temperature setting about 2 °C 15 minutes prior to phototherapy.
- Decrease the set value for humidity.
- Room temperature should be at least 3 °C below the air temperature of the incubator.

**NOTE:** Some phototherapy lights, particularly those without a built-in fan, may cause even greater heating of the incubator and, therefore, require even lower ambient room temperatures.

#### **WARNING !**

The core temperature of the baby must be monitored particularly carefully during phototherapy.

**WARNING !**

Do not cover phototherapy lights or incubator hood with blankets, aluminum foil, or other materials intended to boost the effect of phototherapy. This would cause build-up of heat since the incubator would not be cooled by ambient air, a factor absolutely essential for operation. - Danger of overheating patient!

**Preventing high noise levels**

Excessive noise for the patient may be caused by:

- use of head boxes and/or delivery of pressurized gases,
- objects dropped on the incubator hood.

Therefore:

- Do not place anything on the incubator hood.

**Electrical safety**

**WARNING !**

This device is to be used only in rooms with line power installations complying with national safety standards for hospital patient rooms (e.g. IEC 601.1 "Safety of Medical Equipment).

To maintain grounding integrity, connect only to a "hospital grade" receptacle.

To reduce risk of electric shock, do not remove cover.

Always disconnect supply before servicing.

Use only electromedical accessories complying with CSA 601-1, IEC 601-1, EN 60601-1 or DIN VDE 0750, part 1, UL 544 or other local or state regulations governing the use of electromedical equipment in hospitals.

## Starting Operation

### Wait for incubator warm-up

Wait for about 35 minutes before using incubator.

- Heat incubator in "air temperature control" operating mode.

In order to keep incubator ready for use without delay:

- Operate incubator in standby:  
Set air temperature between **32 °C** and **36 °C**  
and,  
set humidity to **0**.

## Water Supply

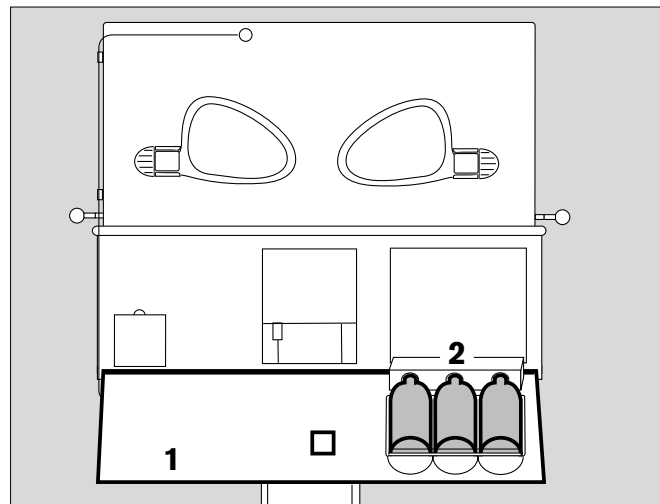
Before placing baby in the incubator:

- 1** Open and lower rear panel.
- 2** Remove empty water bottles from receptacle and replace with three full bottles.

### **WARNING !**

**Use only pure, distilled or demineralized water. Do not add bactericidal agents.**

- Lift rear panel and close it.



## Placing a baby in the incubator

- Open front door (top and bottom part) and pull bed out.
- Put baby on mattress and slide bed back in position.
- Close the front door and check that all latches are properly engaged.
- Keep bed horizontal or tilt, as required.

## Using Air Temperature Control

**WARNING !**

Always measure baby's core temperature at regular intervals!

1 Push power switch in – until it engages = ON.



2 Green LED is lit.

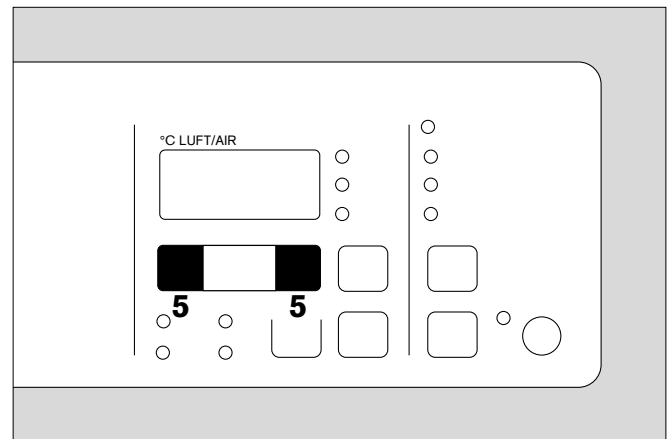
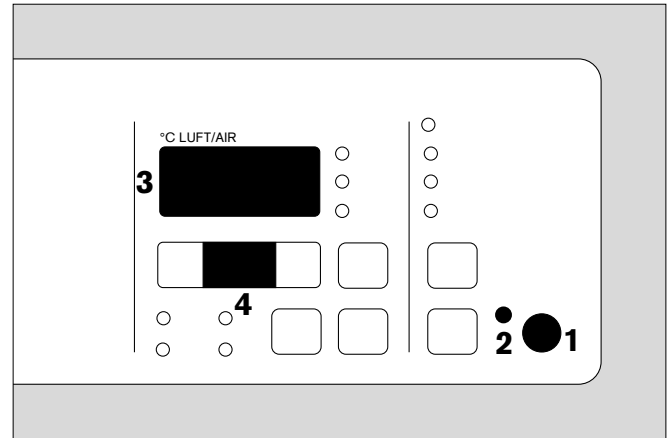
- Wait for self-test to complete. Incubator will then switch to "air temperature control" mode.

**NOTE:** The air temperature control system is always automatically activated at power-up.


3 This display will now alternate between measured value for air temperature and the word **Set**.


4 Flashing display of set value air temperature, default value is **33.0 °C**.



5 Press  or  key briefly to select this set value. The display lights remain continuously lit.


**Setting values in range between 28 °C and 37 °C**

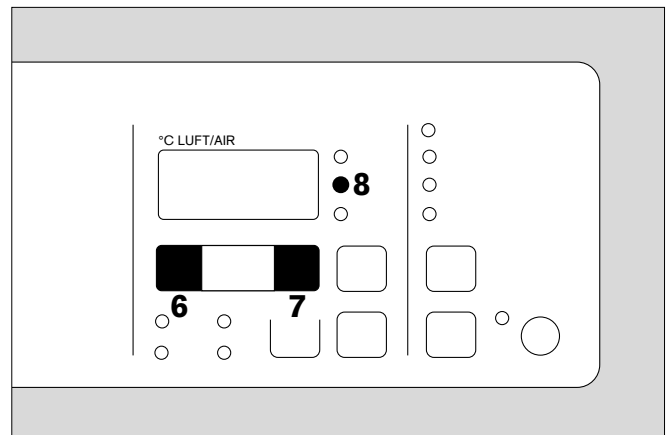
The set value can be changed in 0.1 °C steps.

6 Press  key – set value is decreased,

7 Press  key – set value is increased.

- Press  or  keys until set value desired is reached.

8 Green LED  flashing – incubator is indicating that heater is active.




## Extending Temperature Range From 37 °C to 39 °C



### WARNING !

Temperatures above 37 °C may only be used on the order of a physician.

In this mode of operation, the baby's temperature must be monitored especially carefully.

- 1 Press unlocking button ,
- 2 yellow indicator LED >37 °C lights up.

**NOTE:** This alters the temperature threshold for heater cut-off in the event of overtemperature from 38 °C to 40 °C.

- 3 Keep  or  key pressed until the value desired is displayed.

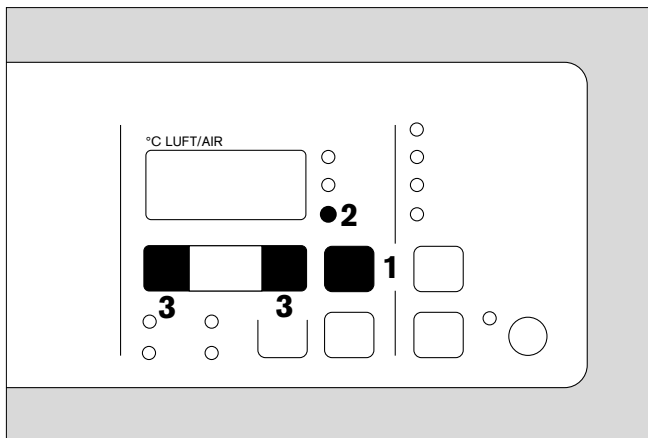
**NOTE:** Set value between 37.1 °C and 39 °C within the next minute.

If extended range settings are not used within one minute

- control LED >37 °C will go off,
- blocking of extended temperature range will be reactivated,
- the threshold for overtemperature will be reset to 38 °C.

Using a set value below 37 °C after use of the extended range will also automatically cancel range extension.

**NOTE:** In case the incubator temperature is still above 38 °C when leaving the extended range, the overtemperature alarm (see page 39) would be triggered. To avoid this alarm: First set value to 37.1 °C and allow incubator to cool below 38 °C. Then set desired value below 37 °C.





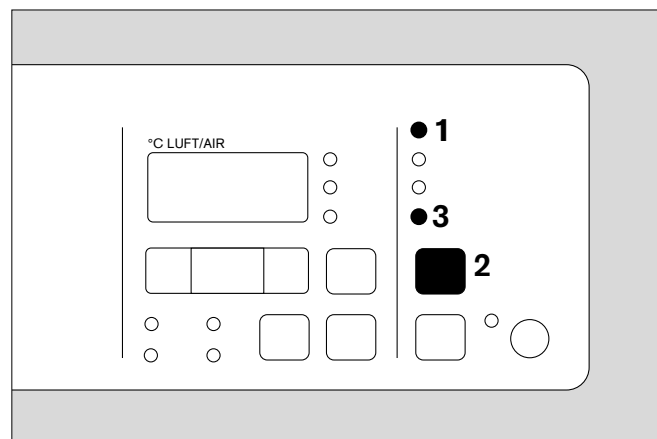
## Alarms

### Zentralalarm

- 1 Rote LED **Alarm** blinkt und ein Alarmton entsprechend dem ausgelösten Alarm ertönt.

Bei Alarmen mit Intervallton kann dieser für 10 Minuten unterdrückt werden:

- 2 Taste  drücken,
- 3 gelbe LED  und rote LED **Alarm** leuchten.

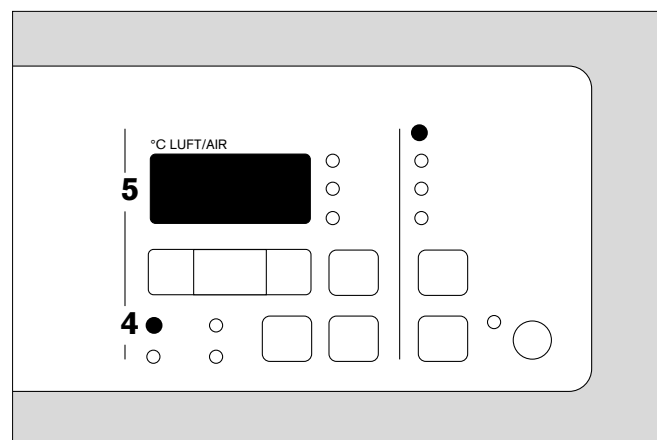


If there is a **deviation of more than  $\pm 1.5$  °C** between set value for air temperature and its measured value:


- Red LED **Alarm** and
- 4 red LED  $\pm 1.5$  °C flashing,
- 5 flashing display and intermittent audible alarm.  
The audible alarm can be silenced for 10 minutes.

When measured value is again within  $\pm 1.5$  °C of the set temperature,


- LED  $\pm 1.5$  °C and LED **Alarm** will go out and audible alarm will stop.




**NOTE:** When the incubator is switched on, the audible alarm is automatically muted for 30 minutes during warm-up:

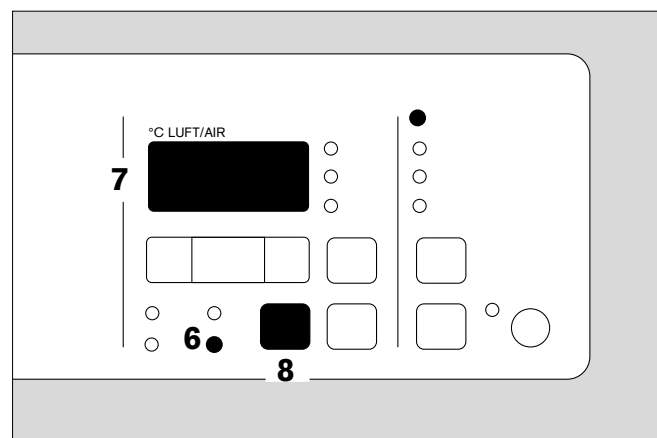
- 4 red  $\pm 1.5$  °C LED and
- yellow  LED and red LED **Alarm** are lit.

If the **air temperature is above 38 °C** (or above 40 °C, respectively, while using extended range):

- Red LED **Alarm** and
- 6 red LED  flashing,
- 7 flashing display and intermittent audible alarm.  
The audible alarm can be silenced for 10 minutes.

When air temperature has fallen below the alarm threshold again:

- 8 Press  key to acknowledge alarm and to reset heater.



The diagram shows the control panel for the 2000 Series. It includes a temperature display labeled "°C LUFT/AIR" with a large "2" indicating the current temperature. Below the display are three buttons for mode selection: "OFF", "ON", and "FAN". To the right of these buttons are two buttons for fan speed control: "FAN" and "ON". The "FAN" button is highlighted with a black square, indicating it is the selected mode. The "ON" button is also highlighted with a black square, indicating it is the selected fan speed. The "OFF" button is highlighted with a black square, indicating it is the selected mode. The "FAN" button is highlighted with a black square, indicating it is the selected mode. The "ON" button is highlighted with a black square, indicating it is the selected fan speed. The "OFF" button is highlighted with a black square, indicating it is the selected mode.

Diagram of the front of the device. The front panel lock (3) is located on the right side of the front panel. The front panel latch (5) is located on the left side of the front panel. A line connects the latch (5) to the lock (3).



**WARNING !**

Always verify that single use sensor probe is specified and approved for use with Dräger Series 8000 incubators.

- Attach sensor tip to skin at an appropriate measuring point using a skin probe adhesive cover pad (if not part of the sensor itself).
- Keep sensor cable in place with adhesive tape as necessary to provide strain relief.

**Placing sensor**

If the baby is lying on his back:

- Attach sensor to the abdomen between navel and sternum.

If the baby is lying on his stomach:

- Attach sensor to the back in the region of the kidneys.

**WARNING !**

The sensor probe must never be placed under the baby. It would be measuring and attempting to control core temperature rather than skin temperature in this case.

- Check regularly that the skin temperature sensor is properly fixed to the baby's skin.

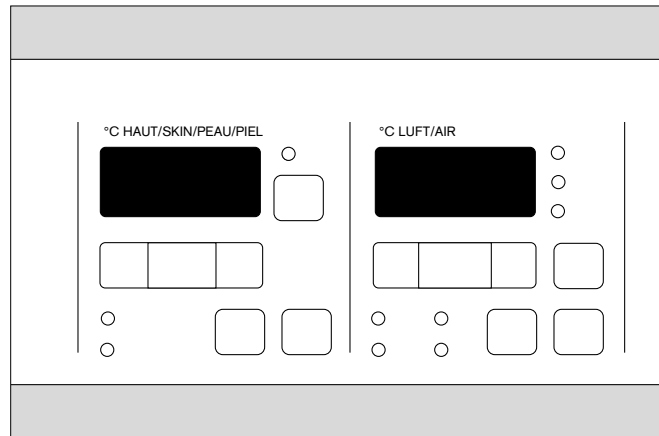
**WARNING !**

A displaced or detached skin temperature sensor would be measuring air temperature so that the baby could become overheated (the temperature of the air in the incubator would, however, not exceed 39 °C).

**WARNING !**

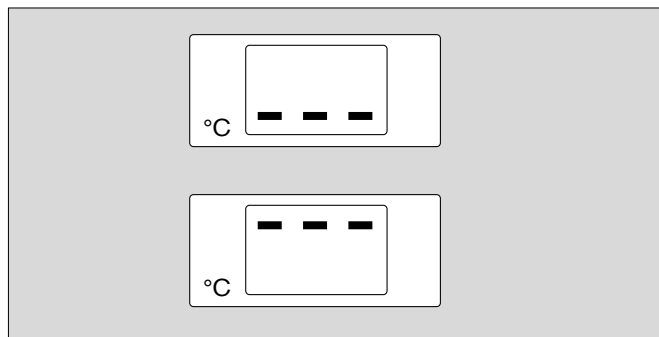
Do not use skin temperature sensors to rectally measure core temperature.

**NOTE:** When a skin temperature sensor is connected while "air temperature control" mode is active, the measured skin temperature is displayed. Skin temperature is not controlled, however.




When the temperature falls outside the measuring range of 33 °C to 38 °C:

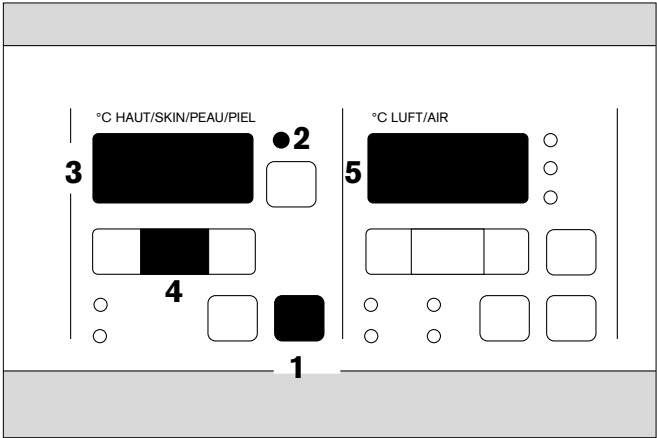
- 3 dashes in the bottom of the display = temperature below 33 °C
- 3 dashes in the top of the display = temperature above 38 °C.
- See page 58.



**NOTE:** Allow at least 5 minutes for the skin temperature sensor to reach the baby's temperature.

When value displayed remains constant,



- 1 Press  key,
- 2 green LED **Control** lights up, skin temperature control is now active.
- 3 The large display alternates between the measured value of skin temperature and the word **Set**.
- 4 The small display for skin temperature set values is flashing.
- 5 The measured value for air temperature continues to be displayed.

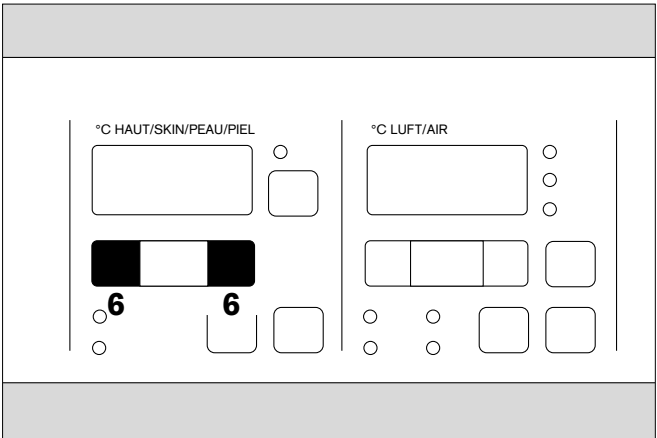


The incubator offers different default values, depending on the situation.



Status	Default
Set value for air temperature not confirmed; defective or disconnected sensor	36.3 °C
Measured skin temperature was below 35 °C when switched to skin mode	35 °C
Measured skin temperature was between 35 °C and 37 °C when switched to skin mode	measured skin temperature is selected
Measured skin temperature above 37 °C when switched to skin mode	37 °C

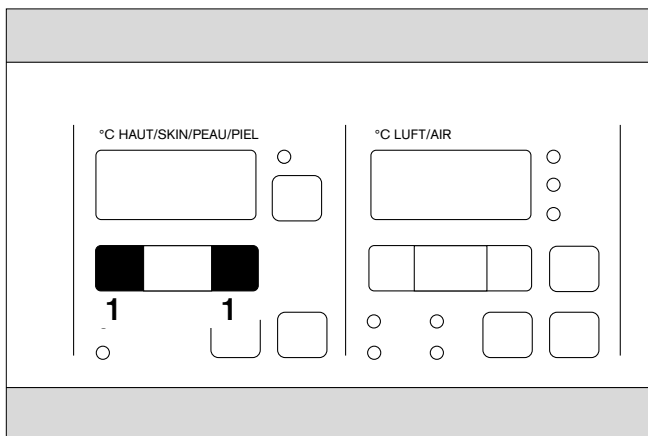
Confirming set value:

- 6 Press  or  key briefly, the display for set values will stop flashing.



### Setting values in range of 35 °C to 37 °C

- 1 Press  or  key until the set value desired is displayed.



### Always allow enough time to reach steady state

Differences between set and measured value of skin temperature are responsible for controlling air temperature inside the incubator between a minimum of 28 °C and a maximum of 39 °C.

When skin temperature is set to a value higher than the measured skin temperature (skin too cold), air temperature in the incubator is increased.

When skin temperature is set to a value lower than the measured skin temperature (skin too warm), air temperature in the incubator is decreased.


The length of time during which there has been a difference between set and measured value of skin temperature also influences changes of incubator air temperature in the respective direction.

The patient's skin temperature can change suddenly, as a result of the baby being fed or being handled, so that deviations of a few tenths of a degree are quite normal.

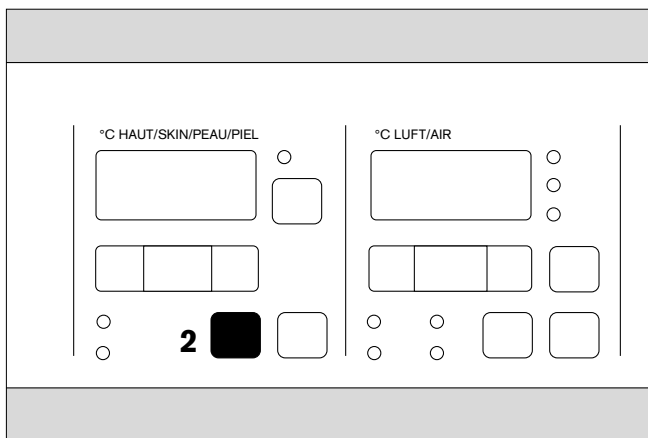
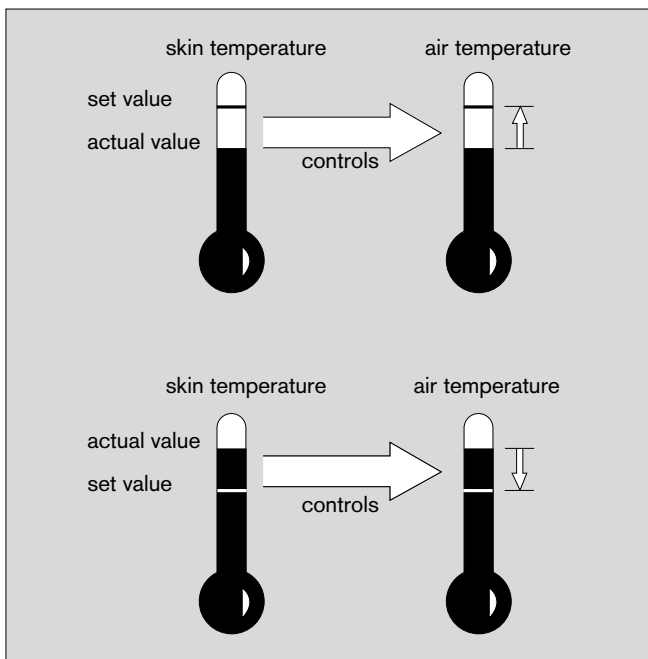
Therefore:

**Do not change set value for skin temperature unnecessarily unless core temperature needs to be corrected.**

Check function during operation:

- 2 Press  key – the simulated temperature value should read as 36 ± 0.1 °C.

- Check daily.



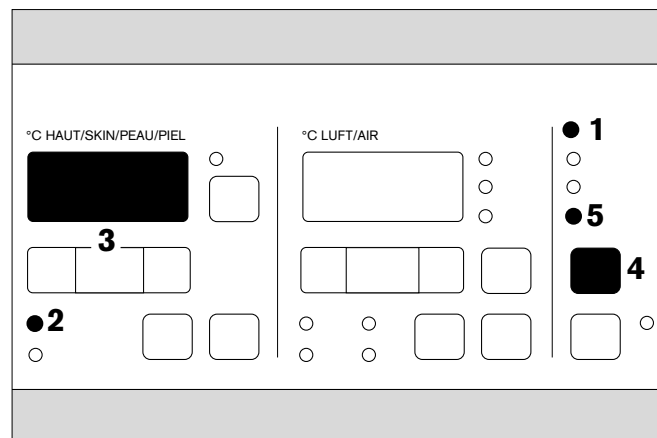
### Alarms

In case of **deviations greater than  $\pm 0.5^{\circ}\text{C}$**  between set and measured value of skin temperature:

- 1 Red LED Alarm and
- 2 red LED  $\pm 0.5^{\circ}\text{C}$  flashing,
- 3 display flashing accompanied by intermittent audible alarm.

The audible alarm can be silenced for 10 minutes:

- 4 Press  button.
- 5 Yellow LED  lights up.



When measured value is again within  $\pm 0.5^{\circ}\text{C}$  of the set value:

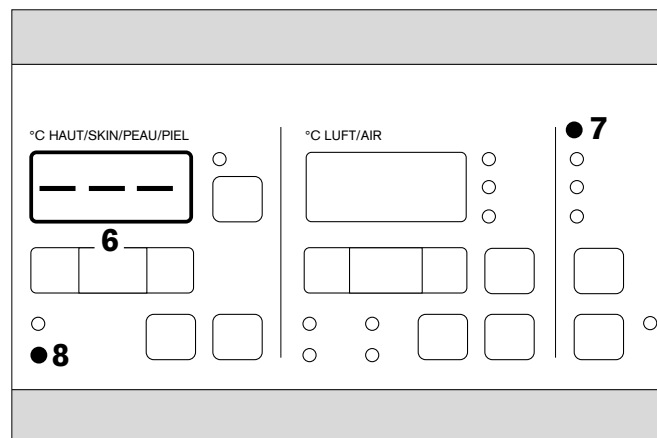
- LED  $\pm 0.5^{\circ}\text{C}$  and LED **Alarm** go out and audible alarm stops.

Wenn der **Sensorstecker gezogen** wurde oder der **Sensor defekt** ist:

- 6 Anzeige von 3 Strichen in der Mitte.

Nach 15 Sekunden:



- Intervallton setzt ein.
- 6 Anzeige von 3 blinkenden Strichen in der Mitte.
- 7 Rote LED **Alarm** und
- 8 rote Alarm-LED **Sensor** leuchten.



Dann:

- Umgehend Sensorstecker einstecken oder Hauttemperatur-Sensor wechseln.

Der Intervallton kann für 10 Minuten unterdrückt werden:

- Taste  drücken, die gelbe LED  und rote LED **Alarm** leuchten.

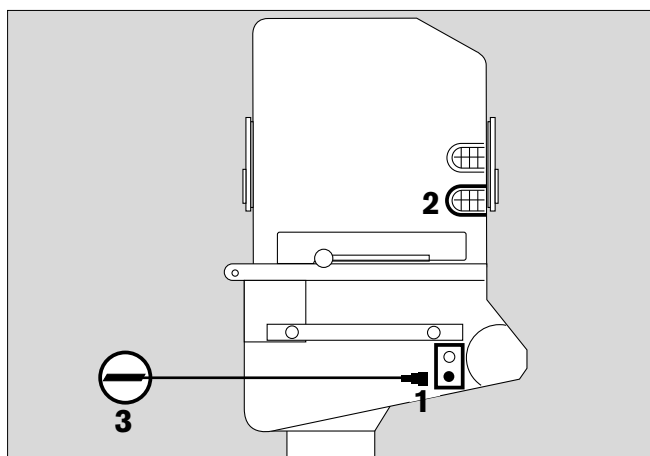
### ThermoMonitoring, optional

Necessary for ThermoMonitoring:



- Second receptacle for peripheral skin temperature sensor
- BabyLink interface board
- BabyView software package
- IMB (or compatible) personal computer

**NOTE:** Always follow the operators manual for accessories used together with the Incubator 8000 NC.

- 1** Connect peripheral skin temperature sensor to the lower socket on the left side of the incubator base.
- 2** Route the cable through one of the U grommets in the hood.
- 3** Remove protection foil from the sensor.
  - Place sensor securely on extremities of the patient, preferable on the foot.
  - Secure the sensor cable with an adhesive strip.
- Connect the PC with the MediCable to the serial interface port of the BabyLink board in the incubator. Follow instruction for Use for the BabyLink.

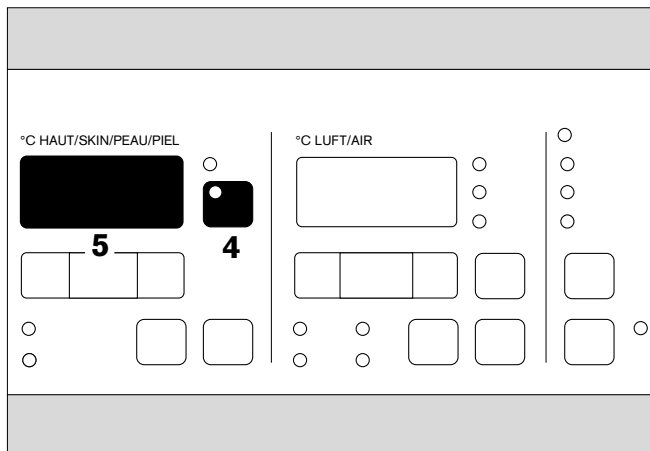


### Display Peripheral Skin Temperature Sensor

- 4** Taste  drücken und gedrückt halten. Die gelbe LED in der Taste leuchtet.
- 5** Die periphere Hauttemperatur wird angezeigt.
- 4** Taste  nicht mehr drücken,
- 5** die Hauttemperatur des ersten Hauttemperatur-Sensors wird wieder angezeigt.

Erscheinen 3 Striche in der Anzeige, siehe Seite 42.

Der Meßwert der peripheren Temperatur hat keine Auswirkungen auf die Regelung des Inkubators. Beide Hauttemperaturen können angezeigt bzw. abgefragt werden, wenn der Inkubator im Lufttemperatur-Mode arbeitet.



## Using Humidity Control

Air temperature and relative humidity are interdependent. If the setting of the incubator air temperature changes, the incubator adjusts humidifier output to keep relative humidity inside the incubator constant despite the changed conditions. A level of up to 85 % relative humidity can be achieved.

The diagram can be used to assist in choosing the appropriate humidifier setting:

### Line A

Response curve for the following ambient conditions:

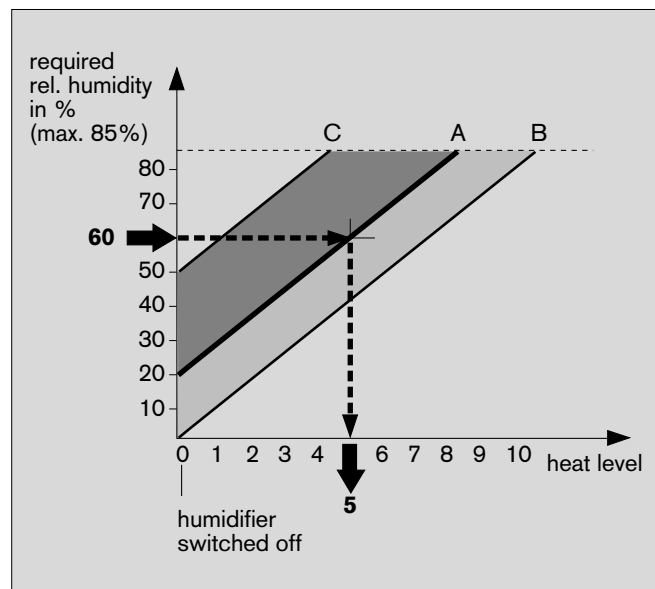
- Room temperature, 25 °C to 28 °C,
- relative humidity, about 30 %

### Line B

For low ambient humidity or when dry oxygen is supplied, the response curve moves down (towards line B).

### Line C

For situations with ambient humidity greater than 30 %, the response curve moves up (towards line C).



Humidity levels for premature babies:

Gestational week	Recommended relative humidity
up to 32nd week	as high as possible
beyond 32nd week to end of therapy	around 50 %

Example:

60 % humidity required.

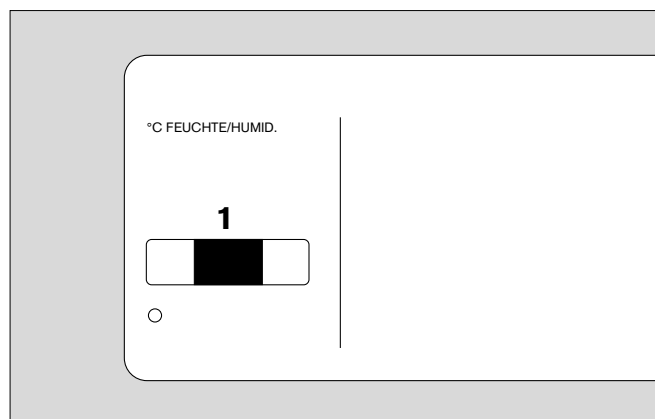
For normal conditions (line A),

**1** Set humidifier to heater level **5**, see page 48.



**NOTE:** Under normal conditions, if heater level 7 or above is set, condensation may occur on the incubator walls.

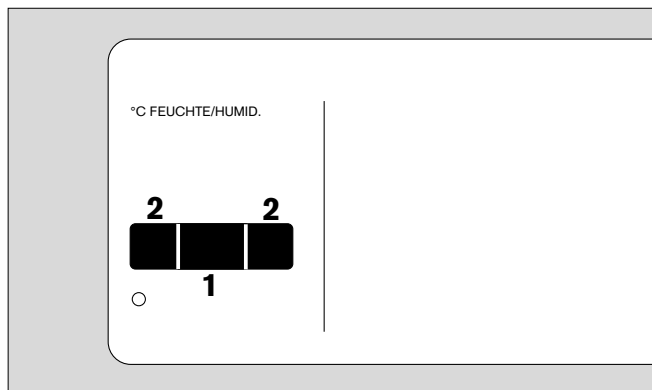
In this case:

- Decrease humidifier heater level by one step.





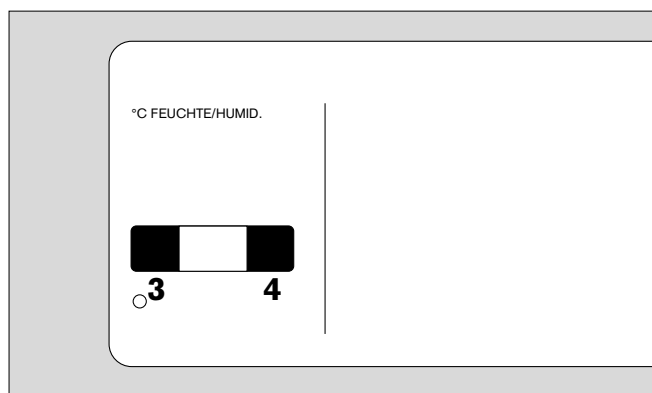
When incubator is switched on:

- 1 0 will be flashing in humidity control display = off
- 2 Press  or  key briefly – to confirm off, 0 remains continuously lit in the display.



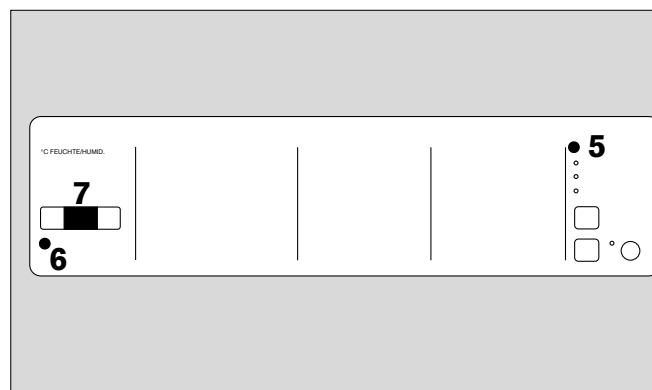
Changing set value:

- 3 Press  key – set value is decreased in steps from 10 to 0 (0 = off).
- 4 Press  key – set value is increased in steps from 1 to 10.



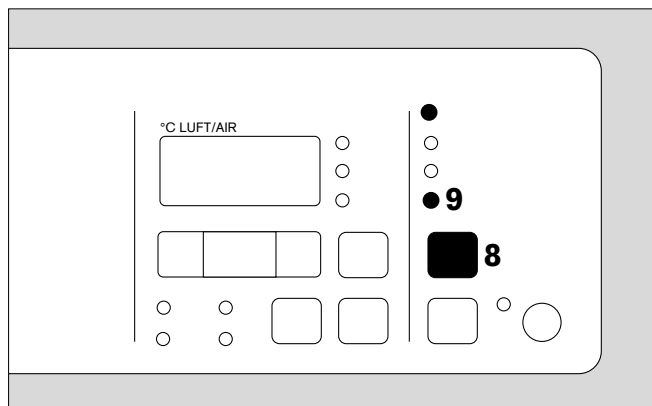
Alarm for empty water supply:

- 5 Red LED Alarm and
  - 6 red LED H<sub>2</sub>O flashing,
  - 7 Display flashing accompanied by intermittent audible alarm.
- Replenish water supply, see page 36.



The intermittent audible alarm can be silenced for 10 minutes:

- 8 Press  key,
- 9 yellow LED  lights up.





## Using Oxygen

### WARNING !

#### Oxygen Concentration

The atmosphere inside the incubator should only be enriched with oxygen by or on the order of a physician or respiratory therapist.

Always monitor oxygen concentration!

### WARNING !

It is absolutely essential that elevated oxygen concentrations are selected on the basis of arterially measured oxygen partial pressure in the blood of the baby. This is the only way of minimizing the risk of both hyperoxemia, which might cause, above all, retrolenta fibroplasia, and hypoxemia which might contribute to intraventricular hemorrhage and damage to the baby's brain.

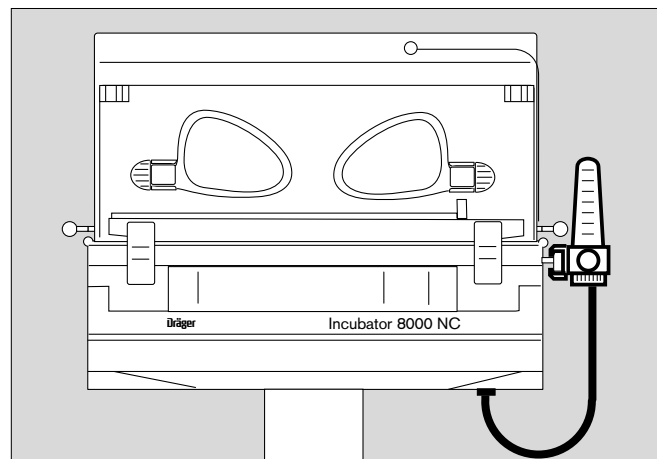
- Monitor  $O_2$  concentration. Always use calibrated  $O_2$  analyzer according to its Operating Instructions.
- Supply oxygen from a medical gas pipeline system or oxygen tank via an  $O_2$  flowmeter.
- Preparation, see page 28.
- Adjust  $O_2$  supply at flowmeter to required concentration.

#### Guideline for flow settings:

Desired $O_2$ conc. %	25	30	35	40	45	50	55	60
$O_2$ flow L/min	2.0	4.5	6.5	9.0	11.5	14	16.5	19

#### Using an oxygen limiter

Prepare and use oxygen limiter according to its Operating Instructions



## Care

Clean and disinfect incubator after each patient, or at least once a week. Perform any disinfection procedures according to established hospital procedures as well as to the following additional instructions.

### WARNING !

**Always follow established hospital procedures for handling equipment contaminated with bodily fluids.**

Before any cleaning procedures, the incubator must first be partially disassembled. For cleaning and disinfecting of accessories, see their respective Operating Instructions.

## Disassembly

- Switch off the device(s), pull power plug(s), and turn off all pressurized gases that may be in use.

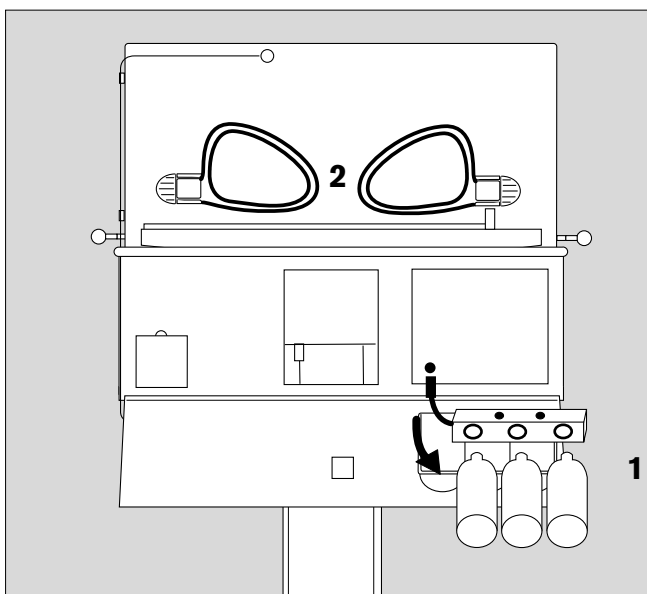
### WARNING !

**Always disconnect from power before cleaning and disinfecting.**

- Remove all accessories.

### Emptying water reservoir

- Open and lower rear panel
  - Remove all three water bottles
- 1 Remove container by lifting it up from holder. Drain water, observing established hospital procedures.
  - Hold hose by cuff and detach from connector on heater.
- 2 Open hand ports.
  - Remove seals from hand port openings and close hand ports again.

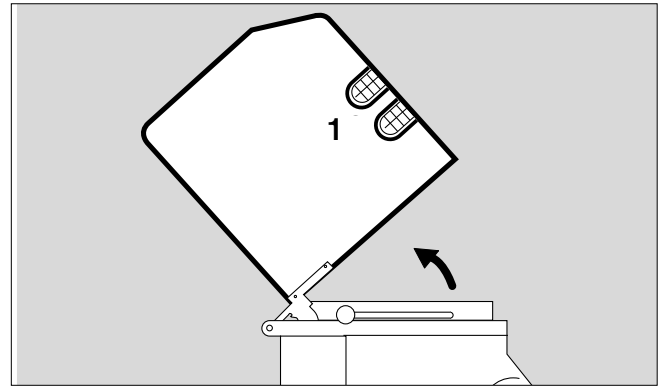


If skin temperature control option has been used:

- Disconnect skin temperature sensor.
- Open front door.
- Remove skin temperature sensor from inside incubator.

1 Remove all silicone U-grommets.

- Tilt incubator hood back as far as it will go.



2 Remove mattress from bed.

3 Lift off bed. Undo screw on ventilator circuit support arm and remove flexible support arm.

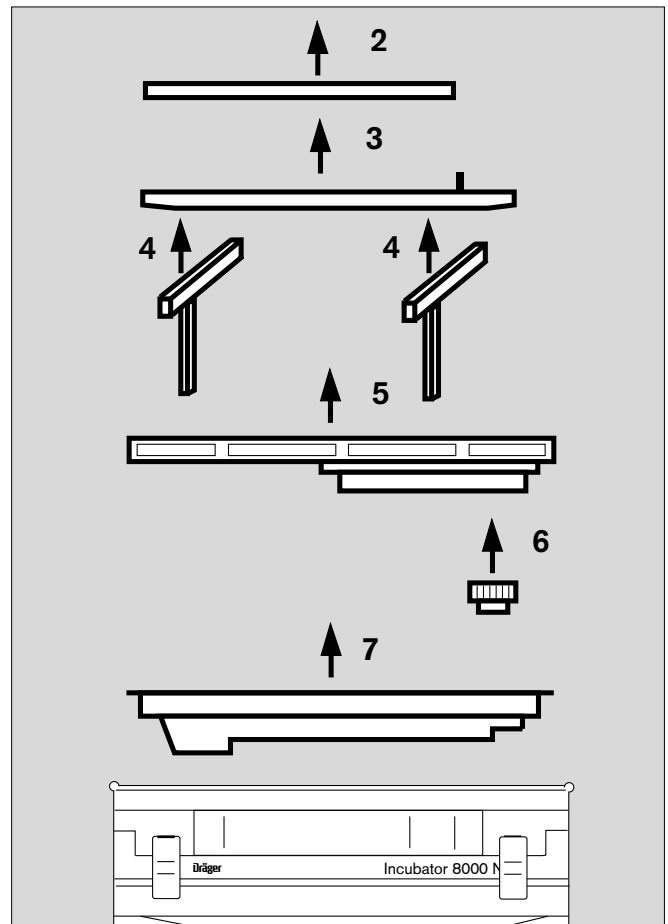
4 Pull bed support brackets up and out.

5 Remove base cover panel.

### WARNING !

#### Danger of burn injury

The exposed heater surface will still be very hot after operation. It may take up to one hour for the temperature to drop to 70 °C (158 °F) with the incubator closed.



6 Remove fan.

7 Remove trough.

**Cleaning / Disinfecting / Sterilizing****CAUTION !**

Certain components of the incubator consist of materials that are sensitive to certain organic solvents sometimes used for cleaning and disinfecting (e.g., alcohols, phenols, halogen releasing compounds, oxygen releasing compounds, strong organic acids, etc.). Exposure to such substances may cause damage that is not always immediately recognized. Do not sterilize incubator and its components with ethylene oxide (EtO) or by exposure to UV radiation (may cause cracks in the PMMA (Plexiglas®) parts!

To prevent any damage, we recommend that only detergents and disinfectants are used that are compatible with the materials used in the incubator and its components and accessories, e.g. surface disinfectants on the basis of

- aldehydes, or
- quarternary ammonium compounds

Ensure that all disinfectants are registered with the U.S. Environmental Protection Agency for use as intended. Always follow the instruction labels specifically with respect to prescribed concentrations and the necessary exposure times.

**Cleaning and Disinfection Procedures**

- incubator body (inside and outside),
  - hood (inside and outside), double walls
  - front door flaps – inside walls folded down (inside and outside),
  - mattress,
  - bed,
  - bed support brackets,
  - base cover panel,
  - trough:
- Remove visible soiling with disposable cloth soaked in detergent.
  - Wipe-disinfect surfaces.
  - Allow exposure time for disinfection as prescribed, then wipe surfaces again with a clean, damp cloth and dry.

## Reassembly

- Fan,
  - seals,
  - U-grommets,
  - water hose,
  - water bottle holder,
  - water container:
- Wash with detergent and rinse with clean water.
  - Bath disinfect parts. Allow exposure time for disinfection as prescribed, then rinse with clear water and dry;

or

- sterilize at 120 °C (248 °F).

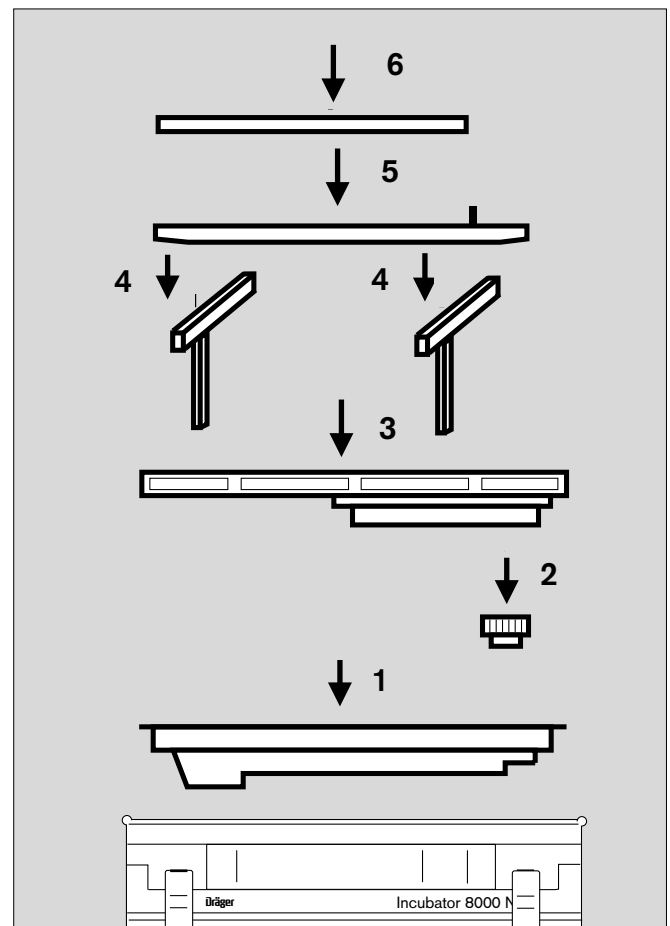
### CAUTION !

When disinfecting the (reusable) skin temperature probe, never immerse plug into the fluid.

## Reassembly

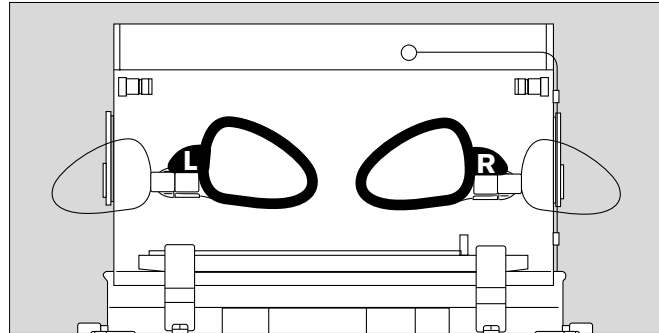
Reassemble components in reverse order:

- 1 Fit trough.
- 2 Push fan wheel on axle.
- 3 Install base cover panel.
- 4 Install bed support brackets.  
Check that the O-rings are correctly positioned on the support brackets. If not, push rings all the way back up or install new O-ring.
- 5 Lay bed on brackets. Watch for correct fit.
- 6 Fit mattress on bed.



Installing hand port seals:

- Insert seal marked with an "L" on its molded tag into left opening.
- Insert seal marked with an "R" on its molded tag into right opening.
- Position molded tag of seal directly on top of hinge. Install with sealing lip (thin edge of profile) facing outside.



## Care for Humidification System

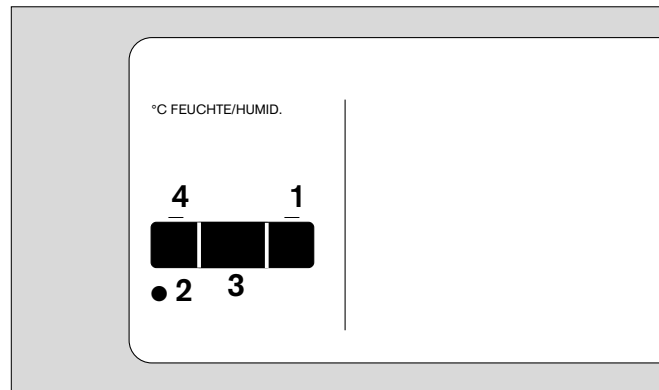
Allow water heater to run dry:

- to disinfect the heater
- to test that "water supply empty" alarm is working properly.

- 1 Select humidity setting **5**, see page 48.

Allow heater to run until "water supply empty" alarm is triggered.

- 2 Red LED **H<sub>2</sub>O** flashing,
- 3 Display flashing accompanied by intermittent audible alarm.
- 4 Switch off humidity control = humidity setting **0**.



**NOTE:** When changing the water bottles or refilling the reservoir, the water boiler will cool down due to the fresh cold water. Expect the humidity in the incubator to drop for 15 to 25 minutes.

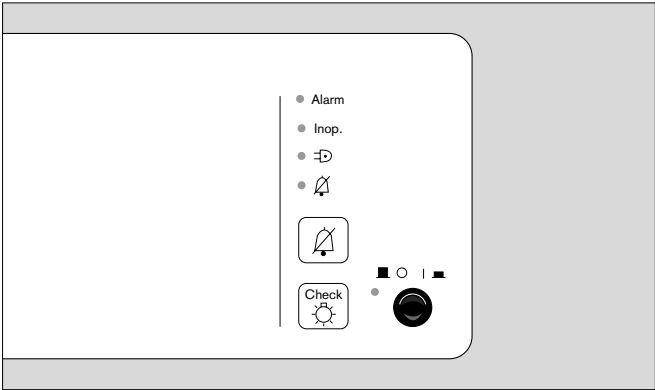
## Before Reusing Incubator



- For "Checking Readiness for Operation", see page 29.
- Operate incubator in standby, see page 36, or
- switch off incubator and cover with dust cover, and store ready for use.



Troubleshooting

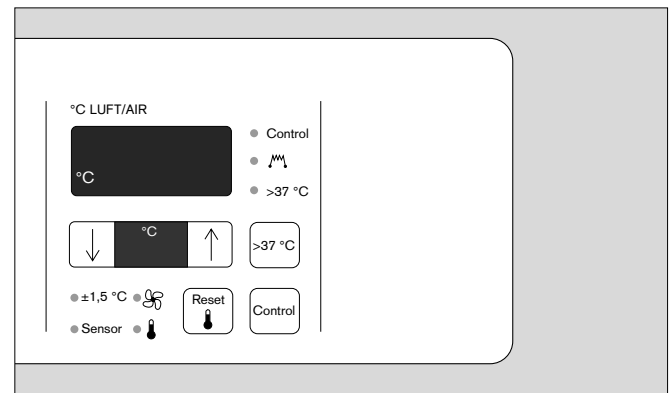
Master Switch Module






Problem/Message	Likely Causes	Remedy
Rote LED <b>Alarm</b> leuchtet. Alarmton ertönt.	Störung in einem Modul.	Klappe mit der Kurz-Bedienungs- anleitung herunterklappen und alarmgebendes Modul feststellen. In "Fehler, Ursache, Abhilfe" des Moduls nachsehen.
Red LED <b>Inop</b> lit. Continuous audible alarm.	General defect in electronics.	Switch incubator off and on again. If <b>Inop</b> message is not repeated: press  key and reset values. If <b>Inop</b> message comes up again, incubator is out of order . Call DrägerService.
Red LED <b>Inop</b> lit. Continous audible alarm, with <b>Err</b> displayed in a module.	Defect in specific module:  Air temperature control module.  Skin temperature control module/ humidity control module.	Switch off incubator. Incubator out of order. Call DrägerService.  Switch off respective module. All other functions remain operational. Call DrägerService.
Red LED  is lit. Continuous audible alarm.	No power.	Check that power plug is connected to line power. Check that power is being supplied. Inform biomedical engineering and/or housekeeping.

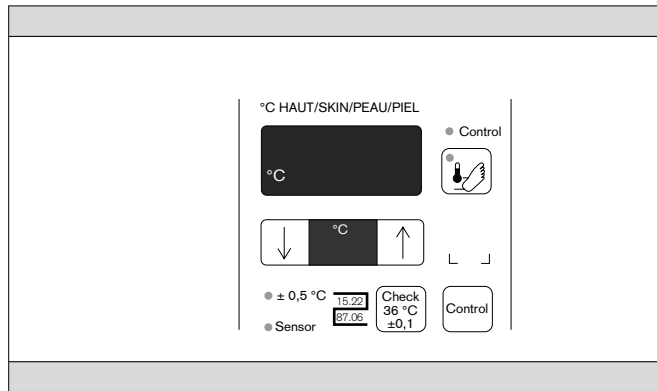



## Air Temperature Control Module



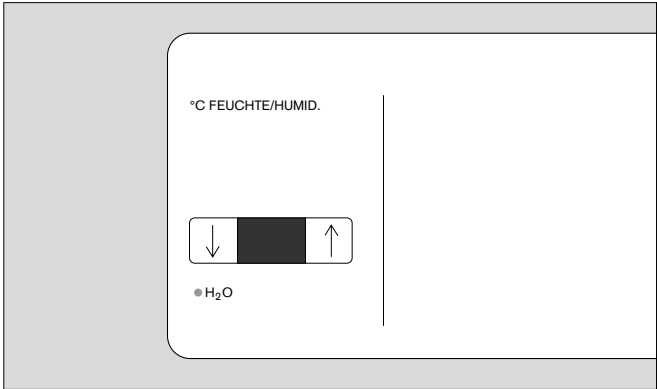
Problem/Message	Likely Causes	Remedy
LED $\pm 1.5$ °C flashing. Display of measured value flashing. Intermittent audible alarm.	Air temperature in incubator is deviating from set value by more than $\pm 1.5$ °C.	Temperature below set value: Close openings in hood and wait for incubator to warm up. Temperature above set value: Avoid additional heat sources (lamps, radiators, sunlight). Wait until incubator has cooled down.
Red LED  flashing. Measured value display flashing. Intermittent audible alarm.	Air temperature above 38 °C (for temperature setting in range up to 37 °C). <b>or</b> Air temperature above 40 °C (for temperature setting in range).	Avoid additional heat sources (lamps, radiators, sunlight). Wait until incubator has cooled down. Press  key when temperature has dropped below the alarm threshold for overtemperature.
Red LED  flashing. Measured value display flashing. Continuous audible alarm.	Fan wheel not installed.  Fan wheel not rotating or rotating too slowly.	Install fan wheel.  Check that fan is properly seated on drive shaft.
Red LED <b>Sensor</b> lit. Three dashes flashing in center of display for measured values. Continuous audible alarm.	Defective air temperature sensor.  Incubator temperature below 5 °C.  Temperature sensor disconnected.	Call DrägerService.  Wait for incubator to warm up fully.  Connect temperature sensor.
<b>Err</b> flashing in display for measured values Red LED <b>Inop</b> in main module lit. Continuous audible alarm.	Defect in air temperature control module.	Call DrägerService.

### Skin Temperature Control Module



Problem/Message	Likely Causes	Remedy
Red LED <b>±0.5 °C</b> flashing. Display of measured value flashing. Intermittent audible alarm.	Skin temperature deviating from set value by more than $\pm 0.5$ °C.	Below set value: Check that sensor is properly attached to patient. Above set value: <b>Measure core temperature of patient and inform physician responsible for patient immediately.</b>
Red LED <b>Sensor</b> lit. Three dashes flashing in center of display for measured values. Continuous audible alarm.	Skin temperature sensor not properly connected.  Defective skin temperature sensor.	Check connection and correct if necessary.  Replace sensor.
<b>Err</b> flashing in display for measured values. Red LED <b>Inop</b> lit in main module. Continuous audible alarm.	Defect in skin temperature control module while in operation.	Switch to air temperature control. Call DrägerService.
<b>Err</b> continuously lit in display of measured values.	Defect in skin temperature control module (while not in operation); skin temperature control switched off.	Other modules continue to operate properly. Call DrägerService.
Reference temperature of 36 °C is outside tolerance of $\pm 0.1$ °C when  key is pressed.	Temperature measuring module not operating accurately.	Call DrägerService.
In der Istwertanzeige leuchten drei Striche oben.	Gemessene Temperatur über 42 °C	Für Abkühlung sorgen. Therapie-Verantwortlichen sofort benachrichtigen.
In der Istwertanzeige leuchten drei Striche unten.	Gemessene Temperatur unter 30 °C	Sensorbefestigung am Patienten überprüfen.

Humidity Control Module



Problem/Message	Likely Causes	Remedy
Red LED <b>H<sub>2</sub>O</b> flashing. Display of set value flashing. Intermittent audible alarm	Water supply depleted.	Refill water container.
<b>Err</b> display flashing alternately with set value. Continuous audible alarm.	Defective humidifier while humidity control active	Switch off humidifier. Set value to <b>0</b> . All other modules continue to operate properly. Call DrägerService.
<b>Err</b> flashing in display.	Defective humidifier while humidity control not active	All other modules continue to operate properly. Call DrägerService.

Inspection and Maintenance

**WARNING !**

To avoid any risk of infection, clean and disinfect incubator and accessories before any maintenance according to established hospital procedures – this applies also when returning units or parts for repair.

**WARNING !**

Always disconnect supply before servicing.

**WARNING !**

Never operate the incubator if it has suffered physical damage or does not seem to operate properly. In this case always refer servicing to properly trained and factory authorized service personnel.

Replacement of Parts

Air filter	replace after two months, see page 30. Discard with regular waste.
Hand port seals	replace, when the material becomes brittle or sticky or when a proper seal with the port can no longer be obtained.
U-grommets	replace, when the material becomes brittle or sticky or when segments are missing.
Fan motor	lubricate with 10 drops of 51524-HLP 32 oil every six months by trained service personnel.
NiCd battery for power failure alarm	to be replaced once a year by factory trained technician

**WARNING !**

**Treatment of batteries**

- Do not throw into fire! risk of explosion
- Do not force open! cells contain corrosive acid

**CAUTION !**

For disposal of batteries, follow all local, state, and federal legislation with respect to environmental protection.

**Preventive Maintenance Intervals**

**WARNING !**

Preventive Maintenance work on the Incubator 8000 NC may be performed by trained and factory authorized staff only.

Inspection and Preventive Maintenance	every six (6) months
Regular safety checks	every six (6) months

## Technical Data

### Ambient conditions:

During operation	
Temperature	20 °C to 30 °C
Atmospheric pressure	900 to 1100 hPa
Rel. humidity	15 to 95 %
During storage	
Temperature	0 °C to 70 °C
Atmospheric pressure	900 to 1100 hPa
Rel. humidity	15 to 95 %

### Operating data

Electrical power source	120 V AC, 60 Hz
Heat output	
Air	400 W
Water heater	100 W
Current consumption	5 ± 0.8 A

### Performance data

Warm up time	35 minutes from 20 °C to 31 °C (with or without humidification)
Temperature drop (at room temperature of 25 °C and temperature inside incubator of 36 °C)	
Two hand ports opened	< 1 °C
Front door (top) opened	< 5 °C
Humidification	Evaporation of distilled or demineralized water
Air speed over the bed	< 15 cm/second
Fresh air flow	39 L/min (60 Hz)
CO <sub>2</sub> elimination, according to IEC 601-2-19/105.1 maximum CO <sub>2</sub> concentration inside incubator	0.2 %
Bed tilting	on right or left, 8° angle each side
Range of measured values	
Air temperature	10 °C to 50 °C
Skin temperature	33 °C to 38 °C

## Technical Data

### Range of set values

Air temperature  
Skin temperature  
Humidity

28 °C to 39 °C

35 °C to 37 °C

Depending on operating conditions, set values from 1 to 10 result in a relative humidity inside the incubator from about 30 to 85 %

### Measuring principles of sensors

Air temperature sensor  
Skin temperature sensor

NTC x 2

NTC

### Noise level inside the canopy

56 dB (A) at 60 Hz;

### Air filter

Particle class P 2, pursuant DIN 3181, factor 2 %

## Skin temperature control

### Sensor

Use only sensors approved for use with Dräger incubators.

### Calibration tolerances

Sensor probe, single use

±0.1 °C

## Classification

The incubator complies with DIN- VDE 0750, Part 1, EN 60601-1, IEC 601-1 and IEC 601-2-19, CSA 22.2-125



Type B

## Manufacturer's certification of electromagnetic compatibility

The 8000 NC Incubator is certified to be free of radio interference emissions pursuant guideline EN 55014:1987/A2 1990, and it complies with guideline 89/336/EEC regarding immunity from electromagnetic interference.

## Dimensions (height x width x depth)

55.1 x 38.2 x 23.6 inches, (1400 x 970 x 600 mm)

## Weight

170 lbs, (77kg)

## Ordering Information

Name and description	Order No.	Name and description	Order No.
<b>Basic unit</b>		<b>Spare parts</b>	
Incubator 8000 NC, USA with control of air temperature, humidity, and skin temperature control	FR 00 083	Air filter	84 02 926
<b>Accessories</b>		Mattress	2M 20 907
Rail, left or right	2M 20 391	Set of hand port doors, right and left	2M 19 550
Swivel cabinet with organizer trays	2M 20 638	Seal for left hand port	2M 19 469
Organizer tray for swivel unit	2M 20 642	Seal for right hand port	2M 19 470
Mounting set for swivel cabinet, left	2M 21 362	Silicone U-grommet	2M 19 511
Mounting set for swivel cabinet, right	2M 21 363	Trough grommet for support bracket	2M 19 595
Accessory IV pole, installs on incubator body		O-ring on support bracket	R 18 074
Instrument tray (20 x 30 cm), rail mount maximum load 2 kg	M 24 678	Water container, with cover and hose	2M 20 644
RS mounting plate, maximum load 20 kg side rail mount	2M 19 460	Skin temperature sensor, single use	
BabyLink-Incubator interface kit	82 90 607	Skin temperature sensor, pack of 10 including 20 adhesive pads	2M 20 737
Medi-Cable, required for connecting interfaced equipment	83 06 488	Adhesive pads, pack of 100	2M 21 734
O <sub>2</sub> high pressure hose, 3 m (10 ft)	M 29 243	Oil for ventilator motor	M 78 39
		Dust cover	2M 68 35









These Instructions for Use apply only to  
**Incubator 8000 NC**  
with Serial No.:

If no Serial No. has been filled in by  
Dräger these Instructions for Use are  
provided for general information only and  
are not intended for use with any specific  
machine or device.

**Dräger, Inc.**

Critical Care Systems

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Subject to alteration

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